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EDMUND RUFFIN, EDITOR AND PROPRIETOR.

THE IMPROVEMENTS ON THE WESTOVER FARM, PRODUCED BY CLOVER AND THE FOUR-SHIFT ROTATION.

To the Editor of the Farmers' Register.

Westover, August 20, 1833.

Dear Sir,—I have here endeavored to answer yours of July last, in the best manner my feeble abilities will allow. You desire me to give you—

"A full and detailed statement of my manner of making wheat on clover lay: the improvement thereby made at Westover; and my opinions, as to what extent (on other soils,) the practice will be found suitable; and all other opinions I may think proper to offer on the subject.

You desire, too, "an expression of my opinion as to the danger of injuring the productiveness of soils by exposure to the sun, (as is necessary in August fallows,) and whether the advantages of my system can be expected on light soils, provided they are made capable of producing good clover."

And finally, you desire me "to communicate, the commencement, progress and results of the improvements made in Curles' Neck."

My preparation for the wheat crop is commenced, as soon as the previous one is disposed of; usually, from the 1st, to the 15th of August. The land for fallow, which is a clover lay, and in eleven feet beds, reversed with large M'Cormick, or Davis ploughs, as deep as it can be done with three or four horses. It frequently happens, that the land is too hard for the ploughing to be done well by one furrow. When this is the case, we are obliged to trench plough, (or run one after the other in the same furrow.) As our time is limited, there must be none lost. And I have generally found, after dry fallows, the succeeding wheat crop to be much better—which is a strong inducement for us to persevere. If the land is in order, it is immediately harrowed; but if the ploughing should be done in a very dry season, the clods will be too hard for the successful use of the harrow. It is therefore left until a rain, when all the harrows are started and continued, until the fallowed land is harrowed over, or till the harrows have caught the ploughs. If done when the land is hard, which is more frequently the case at this season of the year, the time and labor of the teams will be thrown away, as the harrows will make but little impression on the clods, and close but few of the seams left by the plough. In such cases, I have found great benefit from the use of a heavy roller, which facilitates greatly the operation of pulverizing the earth. No further preparation is necessary, but repeated harrowings, until the ground is gotten in such order, that the wheat will be well covered by the harrows. But if the season has been a wet one, the land will be filthy with grass and weeds. You are then obliged to re-fallow the land with small two-horse ploughs, or to use the double shovel-plough, going merely deep enough to destroy the grass and filth, and to put the same beyond reach of the harrows. At this season, the earth is sometimes baked very hard by heavy rains just before seeding, and before much grass can spring up. In such cases I recommend the double shovel, as one of the best instruments I have ever used for putting in wheat on fallow land.

I have scarcely ever found it adviseable to commence seeding wheat sooner than the 10th October, though this should be regulated by the season; if sowed earlier, it is generally injured by the fly, and if the land is much infested by the partridge pea, it should be postponed until we have some cool weather, that the pea may vegetate; then by shallow cultivation, it may be kept from injuring that crop. It is a remarkable fact, that the partridge pea only comes up in cool weather. The plantation on which I live is abundantly set in this grass; yet I have never been much pestered with it in my wheat crops, owing to my leaving such parts as are very badly beset with it unploughed, until cool weather throws up the pea; it is then slightly ploughed, or repeatedly harrowed; and a second crop will not make its appearance that year. If, however, your re-fallow is too deep, you return the seeds of the pea to the surface, or near thereto, which were before too deep to vegetate; and, consequently, you have returned upon you that very crop you were attempting to destroy. I am convinced that by pursuing this course and mowing your fallow field, (or such parts of it, as are very much infested with this pest,) as soon as it gets into pod, it might be exterminated from our fields altogether: If mowed in this state, there will be no second crop of pea, and still the season will not be too far advanced to have a good crop of clover.

The quantity of wheat seeded to the acre, should be regulated by the time of seeding, varying from 4 to 6 pecks; if sown from the 10th to 25th Oct. I am inclined to think, five pecks sufficient for any land that is well prepared. But if later, the land will require more grain, as it will have less time to come up and branch, before the weather gets too cold, while more perishes in the ground. As a proof of this, in the season before the last, between the 10th and 20th of October, I seeded on a field of inferior land, one bushel of purple straw to the acre; and in November thereafter, I seeded 1½ bushels of the same sort of wheat, on much superior land, and the wheat on the inferior land was much thicker, doubly as much so apparently, in the spring. The later the seeding, the thicker it should be; and if possible, it should never be later than the 9th of November. The fallow field being all ready by the 10th of October, we start every thing to getting the wheat in as soon as possible; the seedsman goes on, followed by the harrows. The bed furrows are then opened and straightened, where they require it by the plough; then the cross furrows, (or grips,) are afterwards well opened with hoes and spades; and finally, the whole is chopped over by the hoe hands. These operations should be carried on as much together as possible, so that every night the whole will be finished. If a heavy rain should catch the

and with the wheat sowed and not dragged, the wheat will most probably sprout before it can be harrowed in, and the other operations will be impeded in the same way. I had six beds caught in this situation last fall; not wishing to carry back to the barn a remnant of wheat, as there was no appearance of rain. We had, however, a heavy rain during the night; and next day, the wheat commenced sprouting before the land was in order for the drags. The consequence was, that we were obliged to harrow it in wet; these beds were perceptibly worse the whole year; the land became very much baked, when it got dry, and the crop on it never recovered.

The fallowing operation over, I commence on the corn land, though it rarely happens that the corn is sufficiently matured to be cut down as early as the 10th of October. The corn rows being 5½ feet distance, two of these are thrown together. making eleven feet beds. The ploughing here is done equally as deep as the clover lay; perhaps deeper, as the land is more easily ploughed, being cultivated during the summer. It is a matter of great importance to deepen with the ploughs our stiff soils, as by turning up some of the subsoil it is pulverized by the frost of the winter. It is of great importance also, that the corn land intended for wheat, should be kept clean of grass, otherwise it would impede the plough, and consequently take much longer to put in your wheat, and leave necessarily many hollows and irregular cavities, into which the wheat will fall, and probably perish; owing to the depth at which the seeds will have to vegetate: I greatly prefer eleven or twelve feet beds for wheat on our stiff lands. By throwing two corn rows together, the beds are not raised too high, while the water is more easily drained from them. The ploughing and draining of our stiff soils thoroughly, is unquestionably the most important operation in farming; and many of our barren, (and as some think worn out) soils may be easily reclaimed, and brought into profitable cultivation by more attention to it. Ploughing to the depth of from 8 to 10 inches, and making good drains in every depression of the soil where water is likely to stand, and opening trenches for the water quickly to pass off, cannot be too closely attended to; otherwise the land becomes "sobbed," soured and steril, by being saturated with water. By deep ploughing, the water is more readily absorbed, and the ditches and grips being sufficiently spacious, carry it off immediately. I had a field four years ago, which suffered so much for the want of good ploughing and draining, that there was very little or no growth on the greater part of it except blue and hen's-nest grass; it was well ploughed up for corn during the winter of 1826, ditched and furrowed, and so thoroughly reclaimed, that it promised this season after a clover lay to produce 30 bushels of wheat to the acre. When in fallow before, it was scarcely high enough to be cut, as I am informed by my neighbors. It took freely in clover, with but very little manure applied to any of it. The land seemed to be freshened and revived from its sterility after the softening qualities of the frost had passed away, and it changed from a white, to a good loam color.

The little, and as yet very imperfect improvements I have bestowed on the Westover estate, may be attributed principally to the two operations of ploughing and draining. These may be justly termed the *pabulum vitæ* of profitable land. Every estate which has been subjected to the disastrous operation of the three-shift system, and irregular rotations of crops, may be soon made by these means and the proper application of clover, to double, and finally to treble the product in wheat. The four-shift system, and the great advantages which result from it, have been lately so clearly and forcibly illustrated by my friend Mr. Hill Carter, (to whose skill, judgment and intelligence, James River farmers in Lower Virginia are so greatly indebted,) that I shall be very brief in detailing my own experience of this system.

The Westover estate (with the addition of several hundred acres I have added to it, for the purpose of standing pasturage,) contains about 1200 acres; whereof, rather more than 400 acres are at present arable land. This area (of 400,) is pretty nearly equally divided by a lane running through it, from north to south; each half is then divided by a turning row running east and west, making four fields of 100 acres each. The remainder being all converted into a standing pasture.

I here give an account of the wheat and corn made each year, and the product of each field; showing the difference between corn and fallow land, as taken from my farming memoranda.

Year.	Wheat made on fallow.	Wheat made on corn land.	Whole crop of wheat.	Crop of corn.
1830.	Bushels. 1,600	Bushels. 789	Bushels. 2,389	Barrels. 250
1831.	1,730	844	2,574	375
1832	3,000	991	3,991	500

1830. Late in the fall of 1826, I purchased the estate, with the privilege of seeding a crop of wheat, too late almost to undertake fallowing, but nevertheless I got all the land ready, (viz. 100 acres,) by the 17th October. It was sowed immediately after ploughing; and most of it was filthy, and but very partially taken in clover. I made out by December, to put in wheat 200 acres; this crop as above stated, yielded 2,389 bushels. You will discover from the above table of crops, that the fallow land produced double that of the corn; although the corn land was much the best. Wherever the clover was tolerably good, the wheat was greatly better. All the manure was applied to corn land. We had in corn, the field alluded to, in the first part of this communication, and which was apparently so very poor, that it produced only 250 barrels by great exertions.

1831. The crop of this year was 2,574 bushels. The fallow land producing rather more than double as much as the corn. The corn crop increased 125 barrels. Not more than half the fallow field was sowed in clover, by my predecessor, believing it too poor to produce it. The portion which had no clover on it, was very much injured by the fly, and produced but little, although sowed in good time. The clover land produced very heavy wheat. The same land, when in wheat two years before, I am told, produced only about eleven hundred bushels; all the manure was again applied to the corn land. The crop was considerably injured by the rain before it was thrashed.

1832. This was the first season we had the full benefit of a clover fallow. All the field having been sowed, it took remarkably well, and had a

good clover lay. The crop was 3,991 bushels of good wheat; three thousand of which we reaped from the clover fallow of 100 acres. The caterpillar injured it fully 300 bushels. This would be attested by several gentleman who examined the field particularly; and I am confident of it myself, from thrashing. The injury from catterpillars, was confined almost entirely to a rich bottom. When we came to be injured wheat in thrashing, we could run the machine one hour and a half without stopping to clean up. The balance only one hour. The corn land made but an indifferent crop of wheat. The cold weather having set in sooner than usual, the seed did not come up. About 60 acres, scarcely bronght the seed sown. It will be remembered that the corn land had nearly all the manure made on the estate, it being applied in the spring for corn. This course of manuring corn land is pursued, rather from necessity than choice; not having time in the fall, with our limited means to haul it out. I am not convinced, however, but that it is the most judicious application of it. The corn crop derives the benefit of it; the wheat is always better; and it insures the clover's taking. I have never been able to manure as great a surface as some of my neighbors, never having got over more land than from 30 and 35 acres; perhaps, this year I may reach 40. We use every exertion in our power to accumulate it. The crop of corn increased to 500 barrels.

1833. The crop of this year promised ample returns for our labor. We had a fine clover lay on the field before alluded to. It took in clover thoroughly, to the astonishment of every one, and the crop promised fully as much as the one last year. It all tumbled from its luxuriunce. The wheat on corn land was much better than we had ever had it before. The 200 acres it was thought before the rains set in, would produce 5,000 bushels; it is not yet ascertained what the crop will be, but not half.* The corn crop this year is uncommonly good, and is supposed will yield 800 barrels.

It will be perceived from the foregoing, that great benefits were derived from the clover and fallow system; laboring too, under many disadvantages. We worked regularly only 14 laborers, some very inefficient—11 horses, and but few oxen, not being able to keep them on account of the *distemper*. To enable a just exhibition of the four-shift and fallow system, these numbers should be increased to nearly double, for we have never been able to get in our wheat crops sooner than the 20th November. It may be supposed that the corn land has never had justice done it, in being sown so much later than the fallow. This no doubt is the case; but I have frequently sown some of both the same day, and the fallow invariably yields double or nearly so. The clover land ripens sooner and is less liable to rust.

It is astonishing that clover is not more extensively used in Lower Virginia. It is unquestionably the best manure used for wheat. I should prefer an acre of land well manured with clover, to one with stable manure; and none so cheap. The cost, with plaster, being not much more than $1 per acre: which will give a profit of 300 per cent, with only the trifling additional expeuse of sowing it on the land. We have derived great benefit from the use of plaster of paris, and sow it invariably on the weaker parts of the field. Never having failed in getting my clover to live and thrive well on my corn land, I will here give an acconnt of the mode in which it is sowed, &c. We commenced sowing between the middle and last of February; before the cracks left by the frost are closed. If the land is frozen, the better; for when it thaws, the seed will be covered with the earth; and when that is accomplished, there will be no danger of its being killed by the frost and hard weather. The failure most generally is owing to the seeds sprouting on the surface, and nothing to protect the tender shoot. We put from 6 to 8 pints to the acre, being regulated by the condition of the land to receive it, and the seed. It is rolled in plaster; one portion of seed, and two of plaster—the seed being first made wet. This is done to enable the seedman to sow it regularly, as it will give him a good handful—and acts as a stimulant to the young plant: In 10 years experience, I have never failed in getting it to thrive well on corn land, though I have on fallow. I am inclined to think a previous hoe crop almost essential to its success.

If the fact is admitted, that a clover lay is a good manuring for the land, you must at once admit the four-field system, the best to be pursued on our James River lands—one-third of the whole farm being thus annually manured, and three-fourths yielding a good grain crop. Under no other system can you manure as much land, and at the same time reap as much grain, and consequently, profit. Your fields are kept clean of the blue grass, by the cultivation once in four years in a hoe crop, and exempted from the noxious weeds, which breed or entice the fly; and if attracted by them are more able to rest their ravages.

I must here beg the indulgence of the reader, while I endeavor more clearly to show by comparison the great advantages of the four-shift and fallow system, over the three, or any other. This is done, because there are many good and practical farmers in their operations, who are now delving under this worst of all systems, (the three shift;) and who from the result of long habit, and a dislike to change a few fences, and old standing ditches, are content to labor the remainder of their lives on a poor estate, with a small profit, and hand it down to their posterity in the same impoverished and unprofitable state. There are many instances of this, almost within my view. All that is asked is a change, a fair trial; and if the result is not satisfactory, then the adviser is willing to sacrifice his judgment. We will suppose a farm of 400 acres, under the four shift system; you would have $\frac{1}{4}$ in corn, $\frac{1}{4}$ in clover, and $\frac{1}{2}$ in wheat; with $\frac{1}{3}$ of your corn land annually manured from the offal of the estate. The crops would be from 5 to 800

* Mr. Selden has but slightly alluded to the cause of so great a reduction in the expected amount of his wheat crop of this year—and indeed, the cause was so general through Lower Virginia, and the effects so well made known by heavy losses to every farmer, that more full explanation is not needed in this region, and at this time. But it may be necessary to state to distant readers, that the unexampled quantity and continuance of rain in May, and the early part of June, caused a diminution of at least half the expected amount of our wheat crops, and that very few individuals sustained a small proportional loss.—[*Ed. Farm. Reg.*

barrels of corn, from 3 to 5,000 bushels of wheat, and ¼ of the land manured with clover. Under the three-shift system, you would have ⅓ in corn, ⅓ in wheat, and the remaining ⅓ in pasturage and weeds: for, without the standing pasture, it must be so. Under this system, you would make three or four hundred barrels corn, 1000 to 1500 bushels wheat, and have only about 20 acres of land manured: for the offal of the estate will not furnish the meaes of making more. If under this system, the pasture, or rested field, should be sowed in clover, it will be in a measure lost; and almost entirely so, to the wheat crop; which is our staple and important crop. I will here remark, that within my experience, the corn crop is a more certain one when it follows wheat, than when after clover. It is then free from the worms and other insects, by which the corn is so liable to be destroyed. Under the four-shift system, you may in a few years make your estate rich, and at the same time, receive double the profit. Under the other, it must always be kept at a stand, or retrograding: for it can never advance in fertility.

The system pursued by Mr. Lewis (of Wyanoke,) is a most beautiful one, and his farm much improved under it, (as any would be under his neat and systematic management;) but there are but few farmers who could be satisfied with so small a return from such an extent of arable land and labor employed. Under that system a farm ought to become rich in a very few years, by not mowing and grazing to such an extent as he does. If the object of the clover lay is the improvement of the soil, (which should be the case, where we have so little demand for hay as a crop,) it would be great economy and saving of labor, to plough it under, and thereby manure a much larger surface—the fodder and other offal of the farm being sufficient for the teams and stock. This, however, may be the most profitable and suitable mode of managing a farm of light soil. One of stiff, by not mowing and grazing to such excess, would in a few years, become as rich as desired. Pursuing this course, you lose entirely the benefit of the clover lay for the wheat crop, which is 50 to 100 per cent. For I am persuaded, if he now makes 20 bushels of wheat to the acre, he would, by having wheat to follow after clover, make 30 or 40. By the way, in answer to one of your queries, why should not this system (the four-field) which I have been endeavoring to advocate, be practised on light soils? I assert that it will certainly have this advantage, that the land can be fallowed in almost all seasons, being seldom too wet or too hard, both of which are frequent and serious obstacles with stiff; and a much greater surface can be put in wheat with less labor. The yield may not, perhaps, be as great to the acre; but this is counterbalanced by a large extent of land, with the same, or less labor employed; and that the soil will bear it, I have but little question, provided the clover is all secured to the land, especially if assisted with plaster or lime. A portion of the Shirley estate, is of this character of soil, and yields abundantly in wheat; and I think I have heard Mr. Cartar say, that it was the most profitable portion of his estate, by yielding good crops of both corn and wheat. Such soils would no doubt be much benefited, as it regards the wheat crop, by being trampled by cattle after the clover has matured, or just previous to being fallowed, or rolled heavily in the spring. I find advantage from such a course, even with stiff land; having frequently observed that such portions of the field, as were trodden by cattle produced better wheat: owing, probably, to the clover leaving the land too porous. This, however, should be carefully avoided, until the clover has gotten its full growth, and the blossoms begin to die.

The strongest proof within my knowledge, of the rapid improvement under the four-field and fallow system, was in the Woods' Farm, (a small estate lying in that beautiful neck of land called Curles') but I regret that I am unable to give you a more enlarged account of the improvement of that neck generally; (as I consider it the garden spot of Virginia, in respect to soil.)

In the year 1816, Mr. James M. Selden, took charge of Woods' Farm, of 250 acres of arable land, the remaining 300 acres being all swamp land, subject to the inundation of the tides. Previous to his taking charge of the estate, it had been managed by overseers for a great number of years, under this disastrous system of three fields. To those who are acquainted with the charecter of the soil in the neck, it would be superfluous to say much. I shall therefore only state, that it possesses all the qualities of our best loam lands, only perhaps to a greater degree than any other within my knowledge: and probably, would bear this harsh and bad treatment, to a greater extent than most other soils. Under this three-field rotation, the crops on this estate were never more than 3 or 400 bushels of wheat: and from 100 to 120 barrels of corn. He at once saw that to persevere in this system of cultivation, was to work for nothing, and finally, to be left in utter poverty; so he resolved on a change to the four-field and fallow system. The crops, after the adoption of this change, were in every rotation increased to double, and in a very few years to five or six times the quantity. I will here observe that Mr. James M. Selden, (who was, I think, the best farmer I ever saw,) was the first who ever introduced the four-field and fallow system on James River. Under his very judicious management, this little estate became much improved, and finally, became one of the most productive on tne river, or perhaps in the state. I reaped from one hundred acres of this little farm, 2400 bushels of wheat, and the same year made upwards of 500 barrels of corn. A portion of the corn was made on a small piece of reclaimed swamp land, but which never repaid for the trouble and expense, and scarcely ever yielded as much to the acre as the high-land. The estate has been kept under this system ever since, and is now capable of producing 30 bushels wheat to the acre, and from 7 to 10 barrels of corn. The average crops of wheat, for the 6 years I had the management of it, were near 2,000 bushels, never having more than half in cultivation, viz. 125 acres.—(This was from 1823 to 1829.). What was more remarkable in the improvement of this estate, is, that it never had the advantage of a standing pasture. The cattle, of course, derived all their sustenance from the cultivated portion of the estate, (or clover field.) If, then, laboring under this disadvantage, (which is a great one,) the improvement has been so great, it would necessarily follow, that it would have been much more rapid with the assistance of a standing pasture. In conclusion, my dear sir, I have only to express my regret,

that I have not been able, from the pressure of various duties to develope with fullness and accuracy, my humble notions on the cultivation of the soil. Wishing you every possible success in the useful and meritorious journal you have undertaken the publication of, I subscribe myself,

Your friend and obedient servant,

JOHN A. SELDEN.

For the Farmers' Register.

ON THE PROPAGATION AND HABITS OF THE MOTH-WEEVIL; AND MEANS SUGGESTED TO PREVENT ITS RAVAGES.

There is no insect which has been more injurious to the farmers of Virginia, below the mountains, than the *Moth-weevil*, and there is none, under the depredations of which we suffer, whose origin and habits we are less acquainted with. Fortunately, some means, more or less effectual, have been found to restrain the ravages of weevil—or otherwise, a large proportion of the grain of every crop of corn and wheat would be devoured by the maggots of these insects, and the remainder deteriorated by being ground into meal with this animal admixture. If wheat is left long in the straw before thrashing, or ears of corn placed under circumstancee equally favorable to the operations of weevil, the inside of nine-tenths of the grains of both will serve as a nest, and for food, for their young. But without knowing, or inquiring into the cause, it has long been known that if wheat is thrashed and made into flour, as early as (without regard to weevil,) economy would direct, the loss from this cause is completely avoided. By compelling us, under so heavy a penalty, to thrash and deliver our wheat to the miller early, it is doubtful whether the weevil has not rather been serviceable than injurious to the wheat crops of those who will profit by so forcible a lesson. Still, immense quantities of wheat are lost almost every year, merely from delay in getting out the grain; and in most years, all corn kept in the usual manner until after midsummer, suffers considerably from the ravages of weevil.

The moth-weevil must be far more numerous now than formerly. From what I have heard of the former late treading out of wheat in eastern Virginia, when there were no thrashing machines—and the tobacco culture, then general, caused still more delay in getting the wheat to market—it seems certain that this insect could not then have been so plenty as in latter times. Still they were so injurious as to be considered a serious obstacle to the extension of wheat culture, the remedies being then less understood than since. We learn from one of Mr. Jefferson's letters from France, that the fear of introducing this formidable enemy into Europe, where it was supposed to be unknown, was a strong objection to the importation of wheat from this country. This fear was without foundation. The ravages, and the existence of weevil, seem to depend on the nature of the climate, and very slight variatisns are enough to alter the strongly marked limits of its habitable region. I have heard that none were known west of the Blue Ridge until of late years: but since, they have passed that barrier, and are slowly ascending the country, following the course of the valley of James river. They were not known formerly in the state of Delaware. I infer this from the indirect but conclusive evidence contained in an article from Delaware, published in the Philadelphia Agricultural Memoirs, which recommends as a good practice the treading wheat from the straw on the ground when frozen. If such delay were permitted in any country infested with moth-weevil, there would be generally found in the grain less flour than bran. These insects have not been known for many years together in some parts of Maryland, though very plenty both before and after such long exemption. It is stated in a letter published in the American Farmer (in 1826,) that weevil had re-appeared on the Eastern Shore of Maryland after an absence of perhaps forty years, and were very destructive to the wheat crops—the more so, no doubt, because no precautions had been used to guard against depredations which were so unusual and unexpected. On the whole, the territorial limits within which these insects live, seem to be extending, owing to the increased average temperature produced by clearing and cultivating the country; but these limits are sometimes contracted greatly, and for years together, by spells of severe cold weather.

In northern papers (this summer) statements have been published of great injuries caused to the wheat crops by insects which are called weevil, and which, by the description, seem to act on the grain very much in the same manner.* This visitation was severely felt on the crops in the valley of the Hudson, and still farther north. But notwithstanding the name, and the similarity of operation in some respects, these cannot be the same with our moth-weevil, as the damage by the former appears to have been produced while the crop was standing—or, at any rate, much earlier than the moth-weevil is in action on wheat. The same name being applied to different things, and different names to the same thing, have served to throw additional obscurity over this, as well as many other subjects belonging to agriculture.

The weevil known in more northern countries, we have also in plenty in Virginia, and know it by the name of *black weevil*. This is a very small black beetle, which has wings under the hard cases which protect them, though I have never known them to be used for flying. These insects live through the winter, if their food and shelter remain, and increase from year to year, in any house where they have gained admittance, and where grain always remains: and they can be kept away by care in clearing out the barn, and other precautions, which are totally inoperative in guarding against moth-weevil. Much confusion has grown out of using the same name for these very different insects. The excellent essay on weevil by Caleb Kirk of Delaware, applies altogether to the black weevil.† My observations are intended to be confined to that which I distinguish by the name of the moth-weevil.

Though I have spoken of the moth-weevil as unknown in Europe, in obedience to what are deemed the best authorities, still there is reason to doubt the correctness of that opinion. The following description, which seems to suit that insect, is contained in a letter from a gentleman of Angoumois (in France) to M. Duhamel, and is presented in a report of the Committee of Husbandry of

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* The extensive depredations of these insects are described in one of the selections of our last No. (p. 310) and also in some earlier piece in the Genesee Farmer, if we remember correctly.—[*Ed. Farm. Reg.*

† In Memoirs of Phil. Agr. Soc.

the American Philosophical Society. "The great loss we have suffered in our corn, and especially in our wheat, for 17 or 18 years, has put us on making strict inquiry into the causes of a corruption with which our grain is infected. *The common opinion is, that when the corn is in bloom, that is to say in the month of June, small white butterflies lay their eggs in the flowers. When the grain is ripe, the eggs are inclosed in it*, and as soon as the corn is laid up to be kept, it is found to ferment. This fermentation raises an heat, which hatches the eggs, whence little worms proceed, which are transformed into *chrysalides*, and these are afterwards metamorphosed into gray butterflies or moths." In this description we may trace throughout the apparent or real progress of our moth-weevil.

The insect under consideration is a moth, of a dirty pale yellow color, about the third of an inch in length. Their flight is awkward and feeble, and their bodies so soft and tender as to be liable to injury or destruction from slight causes. They leave their places of concealment in wheat stacks, &c. near sunset, and their fllight and numbers are always well marked by the concourse of bats and night-hawks, which are engaged in devouring them. Night-hawks are seldom seen, and never in great numbers, at other times. It may be well doubted whether any of the weevil escape these enemies, and return to the stack or barn from which they flew. These moths proceed from maggots which are in the grains of corn or of wheat, and their origin, or manner of propagation is the great difficulty, and will be the principal subject of these observations.

Weevil may be produced in myriads wherever corn or wheat is placed in the condition most favorable to their increase, but they are seldom, if ever, met with elsewhere: and yet they are not likely to escape observatien, wherever they might exist. The strangeness of their being thus apparently called into existence merely by grain being made fit for their birth and support, has caused several opinions to prevail with regard to their origin and propagation, which are as much opposed to each other, as to reason and probability. Still, it seemed that we could only choose, as the most probable explanation, that which seemed the least incredible. I will proceed to state the most prominent of these several opinions, and the facts on which they rest; and these facts, I believe, are unquestionable, however different, or however false, may have been the inferences drawn from them.

The first opinion is, "that the eggs of the weevil are all laid on our corn and wheat, after the crops are secured in houses and stacks;" and this rests on the following facts.

These insects begin to show plentifully, both in the maggot and winged state, in our wheat and corn in August, and not one is ever seen much earlier than that time. They continue to come out of the grains as long as the weather remains warm, if the grain continues in the state favorable to them. That the eggs could not have been deposited before the crops were brought from the fields, is sustained by the fact that not a weevil can be seen there, whereas millions would be necessary to deposit so many eggs, as will afterwards hatch, during the short time that the grain of wheat, or of corn, is green and soft.

The second opinion is, "that the eggs of the weevil, like those of the pea-bug and the chinquepin-bug, are deposited in the grain when in a soft state in the field." This opinion has already been stated in the extract quoted above from a French author; and the following shows a similar opinion, as received and prevailing in this country. "A correspondent of the Cambridge Chronicle, who appears to have given much attention to the study of this destructive insect, has written a very sensible essay upon the subject in that paper, from which the following facts are abstracted: 1st. That when the grain is in an unripe, soft and milky state, *and then alone*, the parent fly perforates its upper or smaller end, and therein deposits the egg: and 2d. That to destroy the enemy, to kill the vivific principle of the egg, the grain thus impregnated must be secured from that temperature, necessary to procreation, which nature, uncheated, would be sure to provide, &c." This manner of depositing the egg in the soft grain agrees with nature's operations in propagating other insects, (as we know of the pea-bug,) and seems the only mode possible for so very feeble an insect as the moth-weevil, which scarcely could bore into the ripe and hard grain, and which could not possibly penetrate into a stack of wheat, or even into a bulk of the cleaned grain: and yet so large a portion of the grains in both cases will sometimes be found either tenanted, or hollowed out, by maggots, as to induce the belief that every grain must have contained an egg. The strange fact that the weevil is seldom, if ever seen on corn or wheat in the field, may possibly be caused by the weevil flying more by night than by day, and by one insect being capable (like the queen bee) of laying many thousand eggs. Besides, it is certain that weevil eggs are laid in growing corn, as in the upper grains of some very forward ears, a few weevil holes may be seen when they are gathered in autumn—showing that the continued warm weather had hatched and sent forth the weevil, which in later ears would have continued dormant until next summer. Other facts, which many know, and all may easily try, seem to prove that weevil eggs are laid in the field, and that almost every grain is used for that purpose. If twenty or thirty heads of wheat, or a few ears of corn, are taken from the field immediately to a dwelling house, and locked up in close drawers, where no weevil can possible enter, a very large proportion of the grains of wheat will be weevil-eaten before October, and still more of the corn during the next summer. That these eggs could have been laid in the field is admitted to be strange and inexplicable; but that they could have been laid afterwards, (according to the first opinion,) is absolutely impossible.

A third opinion, (which has fewer, but equally determined advocates, and they mostly practical and observant farmers,) draws its support from the incredibility of both of the others. This is, "that the weevil is a vegetable product, and propagated without the usual intercourse of the sexes, and without animal parentage." I will quote (from the American Farmer, vol. 13,) the reasons for this opinion, contained in a letter written by Mr. Wm. R. Smith, senr. of Scotland Neck, N. C. a farmer of such habits of observation as to give much countenance to any opinion he may support, even when as unphilosophical as this is.

"I have seen in the Farmer a number of communications about the weevil; as I differ with

them all, I have often thought of giving you my opinion on its origin; but being advanced in years, and not much in the habit of writing, only when compelled by business, I have put it off, promising myself at some future day to make the communication: fearing I may still neglect it, I will give you one reason why I differ with all the writers that I have seen on this subject. They all say that the egg is deposited by some insect in each grain while in a soft state. If this is true, I should like to know how the insect makes its way through the husks or shuck of corn when it is five or six double, in such manner as to lay them in each grain? I think all will agree with me, that it is impossible; then how does the egg get in each grain? It must be the natural production of the grain, or some insect deposits something on the bloom or tassel, and it is scattered through the pollen to each grain, for each grain has its silk. Get any of your friends to gather an ear of corn this fall, with all its husk on; put it in some place where no insect can get to it until next spring; then take the husk off and suspend it with any covering that will let air, moisture and heat get to it; I will warrant the weevil will come out. These hints, if attended to by some of your numerous and well informed readers, will enable some of them to do more justice to the subject than I can myself."

My own opinions for a long time agreed with that which was stated the second in order. I owe my change and my present views to a letter from Kentucky, which is published in the American Farmer, p. 74 signed T. S. and is one of those alluded to above by Mr. Smith, as altogether unsatisfactory. This letter is sent for republication in the Farmers' Register.* I confess that at first I attached but little importance to its statements; and it furnishes one of the many instances which I have known, that a preconceived false opinion will cause us often to read without believing, and almost without notice, other opinions from which we might gather correction and truth. In this case, however, I was induced to make some experiments which will be presently reported, and which, I think leave no doubt that all the foregoing opinions are wrong, and that the last referred to is, in the main correct, viz: That there is *a continued re-production of the weevil, in short spaces of time throughout the warm season.* But the observations of the writer, however ingenious and correct, were not made with the accuracy which experiments require, and were liable, in particular, to one important objection. The parcel of grain on which the observations were made, and on which he so nearly traced, by the eye, the continued re-production of weevil, had not been excluded from the access of the insects from without: and therefore, their was no positive proof that the eggs, late as was their hatching, might not have been laid in the field—or that as many insects might have been produced (according to another opinion) without eggs. I admit that what T. S. saw (through a magnifying glass) of eggs, and young maggots, was strongly in favor of his views, and in opposition to the others; but observations so made are extremely delusive, and could not be relied on, unless the progress of a single insect had been observed separately, and traced from the depositing of the egg, to the maggot being sufficiently grown to establish its being the weevil. Several other kinds of insects are found on bulks of cleaned wheat, and a mistake might easily have been made of one for another. But it seemed possible to institute such experiments as would supply this defect, and establish beyond doubt the truth or falsehood not only of this, but of any other of the opinions mentioned above. With this view, the following experiments were planned and executed. The results prove the correctness of the supposition of the continued re-production of weevil: and this, taken in connection with the fact that some few weevil eggs are certainly deposited on corn while yet in the field, (and possibly also on wheat,) will explain satisfactorily the means for the supply, and of the astonishing increase of weevil in our cribs of corn, and stacks of wheat. The whole cause of difficulty respecting the origin and propagation of weevil has been owing to every person supposing the eggs to have been deposited in some one manner, or at some one period—either altogether in the green state, or altogether in the dry—or not at all. The obstinacy with which we all have maintained some one of these different views has kept us blind to the true origin and manner of re-production—which opinion when once examined and admitted, will perhaps seem so clear and undeniable, that the simple annunciation of the facts would be enough to insure their acceptation. But the extracts which I have quoted, and every opinion which may have been heretofore expressed on this subject, by writers and practical farmers, will acquit me of using uncalled, for trouble, or adducing superfluous proof, for the purpose of opposing prevailing errors.

The experiments were made as follows.

June 24, 1833. The corn in my crib, which had been shucked last autumn soon after it was hard, was examined closely, without finding a weevil, or any holes in the grain showing that any had already escaped. Took four ears of white flint or rare-ripe corn (which is much the most subject to be weevil-eaten,) for my experiment. These were examined well through a magnifying *lens*, without discovering any egg attached to the outside of the grain.

EXPERIMENT I.

One of these ears, A, was placed in a large drawer, which was kept locked, and in which some ears of the common large soft corn, and some of *pop* corn (the smallest and hardest, as well as the earliest kind,) had been kept since March. The pop corn already (June 24th,) had weevil maggots visible—the large corn none. This drawer (by possibility,) might have been entered by weevil, as I found afterwards that some of those which hatched got out through a very narrow crack; but it is not likely that any from without entered either the drawer or the house.

This drawer was kept locked, and was seldom opened. It contained loose papers, which furnished shelter and hiding places to the weevil, so that when the drawer was opened to examine the corn, but few of them attempted to escape. Plenty of air had admittance into this drawer, and some glimmering of light.

On Sept. 2nd, this ear (A) appeared (but without counting them) to have weevil holes visible on from one-third to one-half of all of its grains—and the large soft corn in the same drawer had suffered no less.

* It will follow this communication.

The first 10 or 12 days of September were uncommonly warm, after which followed several very cold nights, and fires were required. On the 16th, another examination was made. Nearly all the winged insects were then dead. The damage had so much increased in the preceding 15 days, that out of 492 grains, which the ear (A) had, all except 3 contained either the maggots of weevil, or ead holes from which the perfect insects had escaped. Many grains had 2 holes, and one was observed with 3. All the grains of the ears of large corn seemed to be as completely riddled, though only one row, taken at random as a simple, was counted; and in that, every grain was eaten, and some contained two maggots. There is no question, but that there had been produced in this drawer more weevil than there were grains of wheat.

EXPERIMENT II.

The other three rare-ripe ears were placed (June 24th) in a small and very close drawer within my desk, into which no weevil could possibly have penetrated, and from which light was entirely, and fresh air nearly excluded, except at the short spaces of time when it was opened for examination. These ears were looked at every two or three days: and between the 4th and 10th of July, 3 grains on one of them (B) were observed to have maggots. These had not yet opened their way through the skin of the grain, though its transparency rendered the holes below as visible as if the weevil had already taken flight. These grains were nearer to the bottom than the top of the ear. The three maggots were killed as soon as discovered, by thrusting a pin into their cells; and the ear containing them, (B) and one of the other two, (C) without any mark of weevil, were removed to another similar and close drawer, in the same desk, and completely secured from the access of weevil without. These were frequently examined until September 16th, and *no weevil hole was formed in either*, after the destruction of the three maggots in one of the ears.

EXPERIMENT III.

The fourth ear (D) was left in the first small drawer, and with it was put (a few days after, or about the 15th of July,) an ear of pop corn, containing inclosed maggots, the cells of which were visible—and also a few of the winged insects. This ear was sometimes examined through the magnifying glass, but no eggs, or small maggots, were observed on the outside of the grain, (as was seen by T. S.) until the 1st of September, when two slender white worms, with yellowish heads, were seen crawling on the corn. They quickly escaped from observation by burying themselves between the grains—and to their haste to escape from light, when taken from the perfectly dark drawer, may be attributed my general ill success in observing the worms before they penetrated the grain. They were so small as to be hardly perceptible to the naked eye, when in motion, and not until they had been first discovered through the glass. At no time could I distinguish eggs—though there was plenty of matter of some kind ejected by the weevil, whenever they were on the wing, and this might have contained eggs, and exhibited them to closer observation and a more powerful magnifier than mine.

By the 2nd of September, the weevil were numerous in this ear, but much less so than in those in the large drawer. On the 16th of September, the grains having perforations visible on the exposed parts (as they stood on the ear) were counted, and found to be 270 out of 484, the whole number then on the cob. As no grains were cut open, nor even shelled off, to aid the examination, many or all of the grains which were counted as free, might have contained young weevil. The maggot is not visible to superficial observation, until it is almost or quite grown: and many weevil eat out of the grain below, where they cannot escape, and die there without being seen. At this time, (as in the other drawer,) nearly all the winged insects were killed by cold, and the very few remaining alive seemed to be dying—and their propagation and increase, for that season, were supposed to be ended, and the experiment closed. For this reason, the ear was thrown aside. This is to be regretted—for a very warm spell soon came on, which brought out plenty of weevil elsewhere, and would probably have shown almost every grain of this ear to be tenanted, as well as those used in the first experiment. This however is only conjecture.

It should have been stated, that the winged insects attempted to escape from this drawer, whenever it was opened, and that for this reason, the number of breeders was diminished.

EXPERIMENT IV.

On Sept. 2nd, I gathered from my field an ear of the common large corn, of which the grains were firm and ripe, but far from being dry or shrunken. The ear was so closely covered by its shuck, that no weevil could possibly have penetrated beneath, for the purpose of depositing its eggs on the grain. From the lower half of the ear, 19 grains were taken off by digging them out of the cob, with a knife—they were so soft at the heart that they could not have been shelled off without being broken at bottom. These grains were immediately put into the drawer with the ear (D) used for experiment 3.

On the 16th of September, a weevil maggot nearly half grown, was found exposed to the eye, in the germ of one of these grains, in a small wound made by the knife. This was destroyed in the examination. In two other grains, worms were seen (by using the glass) just beneath the thin transparent skin of the grain, which they had apparently, burrowed along under, like a mole under the surface of the earth. This would not have been apparent to any but very close observation. The vibratory motion of the yellow heads of the worms, caused their presence to be sufficiently evident, though when still, the speck was scarcely perceptible. That the proof might be furnished, that these were weevil, and of course from eggs recently laid, the grains were placed in paper, and carried in my pocket, that they might not want enough warmth to continue to live and growr A few other maggots soon became visible in other grains; and by the 29th, they had shown in 12 of the grains, and in several of them by the cells appearing, merely covered by the skin of the grain, but proving that the insect was nearly ready to come out in a perfect state. On the 6th of October, the last examination was made. At that time, one of the winged insects had left its cell, and was found dead within the paper covering. This was enough to

establish the fact that the weevil egg had been laid and hatched, and that the insect had passed through every change of form, to the perfect winged state, within the time between the 2nd of September and 6th of October. On all the grains, except three, the cells were now visible, externally; and these three, when cut open, were found to be equally well supplied with weevil. Some were in the *chrysalis* state, but generally in the *larva* or maggot state, and nearly all well grown. Of the 16 grains, 2 contained 3 weevil each, 8 contained 2 each, and the remaining 9 had one in each.

The results of these experiments seemed clearly to disprove all the prevailing opinions of the origin and propagation of weevil, and to establish that a few (and generally but very few) of their eggs are deposited on corn in the field, which usually do not hatch before the next summer, when they send forth the progenitors of several successive broods, produced in short periods of time, and rapidly maturing to propagate others. In this manner, their propagation, if not prevented by some means of destruction, would be, in geometrical progression, increasing by a very large ratio—and their numbers, at the end of a few generations might rise to an amount that would at first seem incredible and impossible. For example—suppose the number of eggs laid by each female weevil to be 200, (which is not an extravagant supposition, if we may judge by comparison with many other insects,) and that three successive broods are deposited in and issue from corn during the warm season of any year. According to this supposition, a single female, laying her 200 eggs in October, will produce 200 millions of winged and perfect weevil in the last brood of the next autumn. The prodigious magnitude of this number, will be better comprehended, when I state that 600 barrels (or 3000 bushels) of corn, do not contain so many as 200 millions of grains. I will exhibit the rate of increase upon the foregoing supposition, and also at half of that ratio.

One pair of weevil, supposed to produce 200 eggs in October, which hatch early in July, making
100 females in the first generation,
10,000 in the second, in August,
1,000,000 in the third, in September,
100,000,000 in the fourth, in October, or
200,000,000, counting the males as equal in number.

But if the rate of increase is only half as great, or 50 pairs are produced from each female, the fourth generation so multiplied would amount to 12,500,000—which would be nearly as many as there are grains of corn in 40 barrels.

These examples are by no means intended to represent any possible actual increase, but to show that there is no want of procreative power to produce inconceivable numbers, from the smallest original stock, if all circumstances are favorable for the propagation and preservation of the race. The prodigious procreative power, though not repressed (as in most other animals) by any want of food, is greatly limited by unfavorable temperature, short summers, and all the enemies that prey on those feeble and helpless insects. It is only when these circumstances are guarded against, (as in my first experiment,) that some approach to the real rate of increase can be seen. The manner and rate of increase will serve to explain why more weevil may appear in the last week of a long warm season, than in all the previous time.

There are so many circumstances which, without being suspected to operate, may completely change the results of experiments, that we ought not to trust to the most decisive in appearance, without additional trials, and under varied circumstances. I therefore ask of others to repeat these experiments, and aid in establishing or overthrowing the conclusion which is irresistible, if there is no delusion in them, viz: That eggs of the weevil are laid on corn in the field, but in very small numbers: but that these few are sufficient to fill the whole crop with their progeny during the following summer. If these are truths, the most important inferences grow out of them, which will teach us how to restrain almost entirely the ravages of the moth-weevil.

If either of the three existing opinions of the origin of this insect is admitted as true, it serves to repress, as useless, every attempt to prevent the propagation of the weevil, or to destroy the insects after they assume the winged form, and have ceased to injure the grain. But it will not be so when we know that the first laying of eggs serves merely as the seed for the abundant and destructive broods which follow in the second and third generations. If we could prevent the few first eggs being laid—or could prevent their hatching—or could kill the first small brood as it hatches—either would remedy the evil. And, though altogether mistaken as to the propagation and habits of the insect, chance and observation have long ago taught us how to prevent the worst effects, both on wheat and corn. If we will attend to the truths now ascertained, and use carefully the proper means of prevention, there can be no more considerable danger from this cause. I will state some of the probable, as well as the already known means of prevention.

1. Some few eggs of the weevil are laid on the upper exposed grains, while in the field. This is proved by grains of very forward corn being found weevil eaten when gathered. But these are so few, that even if they live and hatch, their direct damage would be not worth consideration. If all corn intended to be kept later than the 1st of July, was put up without shucking, that protection to the ear would prevent the second brood being laid in the corn—and perhaps the closeness of the bulk would prevent nearly all of the first small brood from hatching. This course would be directed by the supposed origin of weevil—and it is also supported by experience. Corn put up in the shuck, dry and clean, will be far better preserved from weevil than in any other way: and all corn intended for bread in summer and autumn, ought to be kept in that manner. I have kept large quantities in the shuck (when the price was so low as to make selling inexpedient,) to the second, and sometimes the third summer after gathering, and found very little damage from weevil, compared to any shucked corn the next summer after gathering. To save room, and trouble in handling, the outer shucks of my corn had been broken from the ears in gathering, which lessened the protection against the weevil. If all of the shuck had been left, the number of damaged grains would probably have been much fewer.

2. We have been told how to destroy the weevil in its winged state effectually by the fumes of burning sulphur, and even by the smell of the leaves of Pride of China. The last method has been pub-

lished in the Farmers' Register, (No. 3,) and the first, I think, was in one of the early volumes of the American Farmer. Perhaps many other strong smelling vegetables mixed with the corn when put away, would serve to kill the early brood as fast as it was hatched. It is well known, that strong odors of many kinds are insupportable to some insects. Under my former opinion, that every grain that could suffer, already contained an egg, or a maggot, it seemed useless to kill the flying insects, after they had ceased to eat, and could do no more damage. But the case is very different, supposing a continued and rapid renewal of broods to go on. Upon this supposition it becomes important to try these, or other means, for killing every fly, if possible, after its leaving the grain.

3. But whether the winged weevil can be thus killed or not, if the foregoing means of prevention were used, we should be amply compensated by the improved quality of our bread, and of quantity as well as quality of all corn used after July. But it seems likely that another important benefit would be found, in saving the wheat. According to my views of weevil, *the corn must furnish the greater part or all of the brood which afterwards fills the wheat with weevil eggs;* and by preventing or destroying the existence of a few in the corn, we may prevent as many thousands reaching the wheat. The feeble and awkward flight of the weevil forbids the belief of its spreading rapidly, or being able to travel far, without destruction.

4. Early thrashing and cleaning wheat, (say by the 20th of July, in lower Virginia,) prevents damage from weevil, even if the grain is kept through the summer—most probably because the first eggs are laid on the chaff, (as is supposed by the writer referred to above,) and, if so, are separated from the grain before they hatch. If the clean grain be kept spread too thin to heat, there will be very few weevil—and those few, we may suppose, proceed from parents furnished from the adjacent corn-houses, or the grains of wheat left in the straw. But, if they were a thousand times more numerous, they could not (according to the view taken,) affect early cleaned wheat, except the grains on the surface of the heap, because the flying weevil could not penetrate lower. This shows, that the less the surface is changed, the better; and if all seed wheat were kept in small casks (as flour barrels,) and the surface covered with a thin coat of quick lime, or some other dry powder, it seems likely that not a grain could be weevil-eaten. My seed wheat has never been better guarded than by being early cleaned and spread 6 or 8 inches thick over a floor. In this way, some slight damage from weevil may generally be found, but none worth consideration as a loss of value.

Wheat is also preserved from weevil by being bulked in the chaff—and this plan (of which I have no personal experience,) is said to be equally effectual. The security in this case proceeds from the heat produced, which (especially in wheat trodden out on the earth,) is sufficient to kill the eggs.

But if wheat remains in the straw until September and is then cleaned, whether it is placed in large or small bulks, great injury from weevil is generally sure. The number of insects, already well advanced in growth, produce considerable heat, even in small bulks of grain. I do not know whether it is animal heat, or the consequence of animal putrefaction; but it certainly acts to forward the hatching of other weevil. until, in some cases, the heap is entirely mixed with living and dead insects. In this state, all our wheat would be, if no means were used to prevent it.

5. It is probable that the exposure of corn to severe cold, will destroy the first laying of weevil eggs. I recollect having heard it stated, that early gathered corn was most damaged by weevil, and that leaving it in the field until late in winter, was almost a sure safeguard. Even if this were true, as a matter of practice, the remedy would be worse than the disease; but the fact would serve as another exemplification of the truth of the position taken as to the origin and habits of weevil. It is a remarkable fact, that last year, (1832) there was no damage from weevil to wheat, even when thrashed so late, that in other years it would have been worthless. I first learned this of a particular crop in my neighborhood, which the illness and death of the owner prevented being thrashed until late in September; and I afterwards heard it stated that the same absence of weevil was general. How corn was affected, I do not know, not having had my attention drawn to it at the proper time. The preceding winter had been a very cold one, for our country, and the one still earlier (1830-31,) had been severe, beyond precedent for the previous 40 years. Possibly these two cold winters had nearly destroyed the weevil eggs in the corn, leaving almost none to infect the wheat.

6. The universal practice of our country, is to keep corn (in the ear) in open log cribs, through which the air can easily pass; and it is the general opinion, that such houses are necessary to keep the corn in the best condition. This I believe to be true, so far as it respects weevil, but not otherwise. The corn which was spoken of, as being so well kept, from two to three years, in the shuck, was in a closely planked barn, 32 feet square, and the lower story of which was nearly as full as it could be packed. Weevil are disposed to fly out every fair evening, which the open sides of our cribs permit without impediment—and most of them are destroyed by birds and bats. Where a few ears of corn are kept in a close drawer or chest, the damage from weevil is ten times as great, because none of the breeders are destroyed. For the same reason, if my corn in the close barn had not been protected by the shucks, every ear would, in the first summer, have been as completely riddled by weevil as are the few ears left in drawers.

From all the facts which have been presented, and the legitimate deductions therefrom, it seems scarcely doubtful that the depredations of weevil may be always easily, cheaply and effectually controlled. But this important and most desirable conclusion depends on my facts and observations not being mistaken. And, to decide that point, I request the aid and corrections of others. However well assured I may feel, that my observations are correct, it still may be that they are incorrect in some important particulars. When we are mistaken as to causes, we are in great danger of also being mistaken as to their most obvious effects; and I am sensible of being somewhat exposed to this danger, when all my observations of the effects of weevil, until recently, were attended, and perhaps affected, by totally mistaken views of the origin and propagation of these insects.

E. R.

Postscript.—After the foregoing piece had been finished, except inserting the close of the fourth experiment, some additional facts were observed, which may be worth notice, or serve to call the attention of more competent observers, to the habits of weevil.

The weather became again remarkably warm by September 18th, on which day and the next, my thermometer, in the shade, and open air, rose to 90° and 90½°. This brought out a new supply of winged weevil, and they have continued active to this time, the 7th of October. There has been no cold weather within this time, and the general temperature has been warm for the season. The crops of corn have matured uncommonly early this autumn, the greater part, on good land, being hard (though not dry) by the middle of September.—Of course, these circumstances have allowed weevil an unusual length of time to deposit eggs on the ears in the field, and sufficient time and warmth for many of the insects to complete their growth, and come out to lay a second brood. The facts agree with this anticipation, which was founded on the views which have been presented. Since October 3d, I have examined several fields of corn, and find in plenty (what is generally of such rare occurrence,) ears showing weevil-eaten grains. It is only where the ear has outgrown the shuck, or otherwise was not covered by it, that the weevil holes are found—but of all such, very few are without one or more of these marks. But on new corn standing near to houses containing old corn, or wheat, the weevil are far more numerous. I gathered a large ear, which had grown within 60 yards of a crib containing corn well stocked with weevil, and on it counted 89 grains, in which the insects were visible externally, or the holes through which they have already escaped. Some of these grains were so low on the ear, that they must have been securely covered until after the fodder was stripped, which, by killing the plant, caused the shuck to open, and gave admittance to the insects. Of course they had similar means of access to many ears, which did not protrude beyond their covering. A friend and neighbor, whom I have requested to examine his corn, informed me, that his new crop in the field is much more full of weevil, than the last year's crop, of which he has a large quantity (in ears) in his barn, and which we had lately examined, and found to be but little injured. He sent me the points of two ears, as specimens from this field: one had 28 and the other 18 visible weevil cells. The last was of rare-ripe, (or flint) corn, and the other of the common large kind. I suppose he meant that these were specimens of the ears extending beyond the shuck, and near his corn house, as he stated the injury to be much greater there than on more distant parts of his field.

Before being directed, accidentally, to observe these unexpected facts, (and unprecedented, as it respects the great number of weevil in new corn,) I had noticed the old corn, and wheat retained for seed, on several different farms. In my own corn (September 10th,) very few weevil-eaten grains were found, and but for the presence of some of the insects, it would have been supposed that no such damage had been sustained. But though none could be found within the bulk of ears, some few ears, (especially rare-ripe,) were found a little weevil-eaten on the highest part of the heap. My seed wheat, which was in a barn about 60 yards distant, had been thrashed late in July, fanned clean, and spread upon a floor 10 inches thick. A few winged weevil were seen crawling over the heap. No damaged grains were found within, or on the bulk, though doubtless there were some on the surface: the eye does not easily discover the eaten grains in wheat, even when they are so completely hollowed out, as to be easily crushed between the fingers. My barn and cribs had been erected so lately, that these were the first crops they had held—and no grain had ever been kept before within three quarters of a mile of that location. To this circumstance, together with the scarcity of weevil last year, and to my uniform practice of thrashing and sending my wheat to market early, I attribute my singular exemption from weevil this year.

In other cribs, examined in the same neighborhood, there were found remarkable differences in the numbers of weevil, and without reasons for the difference being always apparent. They are generally more scarce than is usual, but some parcels of corn are very full. In some of the latter cases the wheat has not generally been thrashed early: and if all the facts could be ascertained, I have no doubt it would be seen, that by some neglect in previous management, at all such places, a sufficient breeding stock of weevil had been suffered to remain, to produce the present abundant supply. Such a stock of breeders, it seems, is now in every crop of new corn, and I will venture to foretell that *great and unusual injury will take place from this cause next summer*, unless the winter should be very severe, or some artificial means of prevention should be resorted to. It will be especially requisite to thrash and clean the next crop of wheat as early as possible, and to keep in the shuck all corn intended for late consumption.

On the 9th of October, I again examined the corn in my crib, where so few weevil had been found 17 days before. They had increased greatly, though still few in number, compared to other places. The ears in the field, (about 400 yards distant from the grain houses,) which protruded from the shuck, generally showed some weevil holes; and on one, 16 such marks of well grown maggots were counted. But though the corn in the fields is most effected where nearest to old and weevil eaten grain, the protruding ears in the most remote and sheltered situations also show more or less of the operations and presence of weevil. It seems evident, that these insects prefer the soft new corn, to the old, as a receptacle for their eggs—or otherwise, that the hatching and life of the maggots are more certain in the former.

Perhaps I have presumed too much on the patience of the readers of the Farmers' Register in treating this subject at such length—and I may be held as the more inexcusable, because unacquainted with that branch of natural history, to which the subject belongs. In this, as in many other respects, the *entomologist* might render most essential service to agriculture; and, if any one will deign to use, for this purpose, such rough materials as I may have furnished, I shall be content to have the worthless portion condemned and thrown aside. E. R.

ON THE WEEVIL IN WHEAT.

From the American Farmer.

Nelson County, Ky. April 28, 1813.

Mr. Smith:—Wheat being one of our most valuable crops, and the weevil its great enemy,

facts tending to enable the farmer to prevent its ravages must he acceptable. Believing that the facts noted, and the observations made by myself several years past, may have that tendency, or lead others to make observations that will, I am induced to transcribe the notes and observations I then made, and forward for the American Farmer.

As early as convenient after harvest in 1825, I got out some wheat for present use, and put it away on a plank floor in an upper room over the kitchen. During August, I heard much complaint among my neighbors of the ravages of the weevil in their wheat, and was induced to examine my own. I found that which had been cleaned out much weevil eaten, while what in the chaff, either in the barn or stack, was much less affected. I recollected that some, though very few, were to be seen when the wheat was got out. The extraordinary, and so greatly disproportionate increase of the fly in the cleaned wheat, set my mind at work to find out, if possible the cause of that difference.

I had heard of two theories on the subject; the first, that there was a living principle in all wheat, which in a particular state of of heat and moisture, would become animated and produce the weevil. The second, and more common one was, that there was some parent fly which resorted to the field, and impregnated the grain during its soft state, in the manner that fly is known to do in the garden pea. The situation of the cleaned wheat, over a room in which there was always more or less fire, was in some degree favorable to each of these theories; yet on reflection I doubted the truth of either. I argued thus. If there is a principle or quality in the grain, which a given state of atmosphere could animate, so as to produce an insect, the effect would be so general, and so extensive, in the climate where it operates, as to destroy *at once*, whole crops of grain; whereas it was well known, that when the weevil is first discovered, its ravages may be arrested in various ways. And moreover, if this theory had been correct, it must long since have been detected by the investigations of science. As to the impregnation by a parent fly, I considered—that the period during which the operation should take place, must necessity be short, say from five to ten days, immediately preceding the ripening of the grain. When we reflect on the immense number of grains destroyed in a bad weevil year, it is obvious that if the number of flies requisite to impregnate all these grains, in a few days, should resort to the wheat field, the number must be so exceedingly great, as often to have attracted the attention of the vigilant and intelligent agriculturist; such, no doubt, would often have seen the parent fly in actual contact with the grain in the ear, as in case of the pea. Again—if all the grains became impregnated within a few days of the same time, it should seem probable at least, that the coming forth of the weevil would be equally simultaneous—whereas it is equally well known, that after the weevil fly begins to appear, it progresses with increased ratio, till checked by the cold of autumn.

Distrusting these theories, and seeing the great increase on wheat to which the fly had free access, I was led to the supposition that there must be a continual increase, by propagation, during the warm season. This suggested the idea of borrowing a magnifying glass of a silversmith, for the purpose of a more minute examination than I was capable of making with my specticles, which age have obliged me to use.

On the 22d of August, by the use of the glass, I discovered what I had never heard of before, the eggs, or nits, of the gray weevil fly on many grains of wheat. They were generally of a pale reddish color, somewhat brighter than the color of the wheat, though some of them were nearly white. These eggs were mostly deposited in the crease or indenture on one side of the grain, and adhered with a slight degree of tenacity. A number of these grains with eggs or nits on them, were selected and put away in a saucer. They were examined each day, but no preceivable change until the 27th, when, instead of the transparency which they had exhibited, they appeared to consist only of a coat or web of the thinnest conceivable texture. On pressing them they did not crack as before. On closer examination a number of small worms were seen, remarkably active, some on the grains of wheat, and some on the saucer. On the 29th there was scarce a nit to be seen on its original transparent state, so that all the eggs or nits on the grains which had been put in the saucer, had been hatched in about three days. I entertained no doubt that the little worm had proceeded from the egg. And from the frequent attempts which it appeared to make to penetrate the grain, by its assiduous exertions at one spot, I was led to the opinion that it did actually eat its way through the bran into the grain.

I was then desirous to ascertain whether the eggs or nits I had seen, were really those of the weevil fly. To this end, I confined three of these flies in a glass tumbler, by covering it with a book and put several grains of wheat in with them. I continued to notice them daily, till about the sixth day, when I found that two of the flies were gone, having been let out as I supposed by the children, and one was dead. On examination, I found three different bunches of nits on the bottom of the glass precisely like those I had seen on the wheat. By the help of the magnifying glass I could count them, there were upwards of twenty eggs in each bunch, the eggs in each several bunch adhering together. This experiment I again repeated, with the same result, except that the number of eggs were fewer.

During my attention to this subject, I became enabled to pick out, almost unerringly, the grains of wheat that had worms, however small. I found them from the smallest size, scarcely larger than those I had seen in the saucer, up to the size of the maggot just before going into the chrysalis state. I also could discern the hole, through which, according to the opinion of some, the parent fly had deposited the young in the grain, or through which, as was my own opinion, the worm itself had entered. This hole was not larger than would admit the point of a very small needle—too small for the naked eye of most persons. The grains impregnated, I found vastly more numerous among the cleaned wheat, than among the unthrashed.

On the unthrashed wheat I found the nits on the heads, generally on the inside of the outer coat of the chaff, sometimes on the outside, rarely on the grain. It was discovered at the same time that the weevil was flying about the Indian corn in the crib. I found on examination much of the corn perforated, as the grains of wheat are, when the weevil has left them. It was easy also to distin-

tinguish the grain that contained worms in the maggot, or chrysalis state. I also saw in many instances the small hole through which the worm had entered. The eggs or nits precisely similar in appearance, I found also, generally on the cob, where some grains had been shattered off. In both the wheat and the corn, the hole was generally in that softer part of the grain from which the germ or bud proceeds—the part most difficult to be got at by a parent fly, supposed to impregnate the grain.

These facts coming under my observation, when taken in connection with one of general notoriety, to wit, that the progress, or multiplication of the weevil, is in an increased ratio during the season of its continuance, when not arrested by the hand of the husbandman, go in my humble judgment to prove, that the weevil reproduces its own species in short periods during the warm season—and always most, where they have free access to the grain. To establish my position beyond a doubt, there is only one link wanting in the chain of facts stated—and that is, the actual entry of the young worm hatched from the nit, into the grain. This I did uot witness. The extreme smallness of the object, and the weariness to the eye, and to the neck indeed, by a long application of the glass, prevented me from satisfying myself on that point. Yet from the intense exertions of one of those little creatures, at one spot, and his repeated return to it, I fully embraced the opinion that the worm, the produce of the nit, does thus eat his way through the bran into the grain. If not, these worms must produce some other insect, the immensity of whose numbers, about the barn and stack yard, would have attracted attention.

The importance attached to this theory, if it be the true one, consists in the conviction on the mind of the farmer, that when reaped, his wheat is not materially injured—and that by due vigilance he may secure it from the ravages of its greatest enemy, the weevil. Three modes of preserving it, obviously present themselves—first, to place it in a situation *to exclude the fly that is on the wing*, thereby to prevent the deposite of its eggs. Secondly, by the application of heat, so as to destroy the worms in and the eggs on, the wheat—or thirdly, to keep it in a situation too cool to admit of hatching the eggs, and the growth of the worm. I am, very repectfully, T. S.

HORSES.

Productive Power of the Arabian Blood.

Translated for the Farmers' Register, from the *Journal d'Agriculture, etc. des Pays-Bas.*

In the Arabian horse, is the germ of all the noble qualities which distinguish the species. Every known race of horses, remarkable for their excellence, owe it exclusively to this stock, and are noble only by their affinity to it. The Turkish horse, the Persian horse, the Barb, the Egyptian and the Spanish horse, the English, Polish and Russian horses, and those bred in our studs and in the other countries of Europe, are of noble breed, only as a portion more or less abundant of Arab blood flows in their veins. The name of *thorough-bred (pur sang,)* has been given to the English race horses, only because they are the direct product of Arabian sires and dams, without any mixture of impure blood. Yet it cannot be denied, that many eastern horses of unknown origin, but of great value, as well as many Turkish stallions and Barbs, have greatly contributed to the existence of the races of this kingdom, particularly to that of the present breed of race horses, and that it is, in part, these stallions that have actually introduced the Arabian blood. If, then, the English race horse is called thorough-bred, there is still stronger reason for giving the name of *full bred (race pure)* horses, to those of our studs, which are the offspring of English thorough-bred mares and Arabian stallions.

Of several races having for their common origin the Arabian horse, that whose qualities shall approximate the nearest to the qualities of its oriental ancestors, will alone be able claim a merit superior to that of the others: in the same manner also, the reproductive power of one of these races, will diminish in proportion to the deterioration it shall have suffered from the influence of the country, and of the attention it has received, whatever, in other respects, may be the purity of its origin. Of this the stock of thorough-bred English horses, is a present proof.

We do not design to enter upon a long research into the causes, which give to the Arabian horse the advantages which distinguish him from all other horses in the world; we will only say, that if we are to judge of him merely from his performances, this horse owes the superiority of his form and his qualities to the care of which he is the object, to the climate and the country in which he lives, and, above all, to the scrupulous attention, and the perseverance which the Arabians employ in breeding only from the best stocks; and, finally, to the complete existence of privations, and to the nomadic habits, to which he is subjected. It is by this perpetual succession of the same management and the same food, by this same absence of every species of domestic or servile labor, that the Arabian horse has become, like his master, a true child of the desert; and has succeeded in making docility, temperance, speed and durability, qualities, in some sort, inherent in his being. Such, also, are certainly the causes to which we should attribute the fidelity with which, in his deserts, he transmits and preserves his superior form and qualities. We are the more convinced of the correctness of this opinion, since, as soon as he has left the arid soil of his birth, we see him undergo modifications more or less distinct, and since, we find in a great measure, the forms and qualities which are peculiar to him in the horses of other nations of Africa and Asia, which lead a life similar to that of the Arabs, and which, like them, inhabit a burning climate, and make an exclusive a use of the noble animal of which we speak. This similarity of form, of vigor, durability and activity, is particularly remarkable in the horses of Egypt, Barbary, Turcomania and Kurdistan.

It is then with justice, that the excellence of the different *breeds* of horses in other countries is determined by their more or less immediate origin frow the Arabian blood: the beauty, force, *bottom* and activity of each of these, is dependent on the same degrees of propinquity, as well as on the more or less decided degeneration which the blood of this precious stock may have suffered from too great a difference of treatment and climate. Hence it follows, necessarily, that the more nearly a breed

of horses is allied to the Arabian, the more excellent it is; and that the breed which should be regenerated anew, from the Arab blood, to remove the alterations it may have undergone from the influences of which we have just spoken, would be restored to its primitive state much more quickly and more certainly, than it could be by the employment of stallions of another stock, however distinguished they might be. What we have now said of the advantages of the use of the Arabian blood, as a *regenerator*, is a truth of which the breeders of horses cannot be too thoroughly convinced, and which they ought all to have constantly in view.

It is, indeed, most astonishing to see the incredible multiplicity of forms, under which the Arabian blood has been diffused in so many different countries and climates; it is found especially in Persia, in Egypt, in Barbary and in England, with modifications of conformation, peculiar to each of these countries, it is true, but always with the type, more or less marked, which distinguishes the race. It is seen also, but with a less decided character, in some stocks of eastern Russia, in the studs of Poland, and in some othor countries of Europe.

The Arabian blood then, as is shown, exercises a powerful influence in our climates, on the re-production or regeneration of the thorough-bred horse, whether it be mixed or not, with other stocks already improved; and breeders cannot make it too earnestly the object of their experiments and observations.

HORIZONTAL TRENCHING, TO PREVENT THE WASHING OF HILLY LANDS.

To the Editor of the Farmers' Register.

The interest which your journal has already excited among the agriculturists in this section of the country, furnishes some ground for hope, that the improvement of the lands on the waters of the Roanoke, where they have been most neglected, (or to speak more correctly, where they have been must butchered,) will at last occupy the serious attention of our farmers. We have heretofore wanted an outlet to the ocean; tobacco has been our only crop, and we have experienced, to the fullest extent, all the evils attending its cultivation. Our lands are nearly exhausted, and we are now on the look out to discover some means of restoring their fertility. A desire to improve, begins pretty generally to prevail: information is what we want; you have, in your valuable journal, given us much, and will no doubt give us more. The Farmers' Register is beginning to attract attention, and many inquiries are made for it; and I hope the time will soon arrive, when it will be in the hands of all our agriculturists.

The wheat crop is becoming more profitable, as the facilities of market have increased very much since the construction of the Petersburg rail road, and will be still more increased, when that from Portsmouth is complete. Manufacturing mills, of improved construction, are being erected on our water courses; and we have every reason to believe, that wheat will be the great staple of the valley of the Roanoke, the soil and climate of which are as well adapted to its culture, as those of any part of Virginia.

The great impediment in the way of improvement of the lands of the Roanoke, (I speak more especially of those countries on its two great branches, the Dan and Staunton,) is the unevenness of the country. You who reside within the limits of tide water, can scarcely estimate it. We manure our land carefully, and the first heavy rain carries that, and what soil there may be, to the bottoms. This single circumstance, viz: the brokenness of our country, has done more to repress the progress of improvement, than every thing else put together. Why manure land, when the first rain may sweep it entirely away? Hence, what little manuring is done, is pretty much in the following manner. The owner of five hundred acres of land, selects some level spot of about 25,000 tobacco hills, (6 or 7 acres,) convenient to his house. This he lays off for tobacco; it is cultivated every year in the same crop, and every year he puts on this favored spot every particle of manure which he accumulates, or rather which is accumulated, for he pays no attention to the subject. The end of 10 years, finds his lot in about the same state as at first, and the balance of his plantation exhausted. This history of a single plantation, is the history of the whole Roanoke country. To us then, improvement is not choice, but necessity. But to give you this mournful account of the sad state of our agriculture was not my intention when I sat down to write to you. It was rather to tell you what we were doing, than what we had omitted to do—to comply with the request of a mutual friend who solicited me to give you some account of a method practised by a few persons in Halifax and Mecklenburg, for the protection of their hill-sides from the effects of washing rains.

This system is technically called *trenching*. Who was the inventor I know not. It was first practised, as far as my knowledge extends, by Mr. Skipwith of Mecklenburg. His lands are exceedingly broken, and he has carried the system to such perfection, as to put an entire stop to washings by the heaviest rains. So much so, that I have heard of his saying, that not a pound of soil was lost on his extensive estate, by the greatest fall of rain. I wish the application had been made to him, rather than myself, to give the public information on this subject. He is, indeed, a good cultivator—an enlightened farmer, practically and theoretically—while I am a tyro—a young man and a young farmer—eager indeed to learn, but unable to teach. I have practised the system for 3 years—the first two years it was badly done, for want of experience. The corn land for the present year is better done, and I may safely say, that in an extensive field of about 200 acres, as broken as any in Virginia, there is no washing, nor a single corn-bed broken by the rains.

The first thing to be done, is to lay off the trenches. This must be correctly done, or instead of conducting the water gradually off, and preventing the wash of soil, the land will soon be intersected by deep gullies. The *level* here most in use, is what is familiarly known by the name of the rafter-level. It consists of 2 pieces of scantling, about 6 feet long, lapped at an angle of 45 degrees, (or squared,) making a span of 12 feet. The shanks should be precisely of the same length. From the apex, a line is suspended with a plumb at bottom. Across the shanks, a piece should be fixed, on which notches should be made to mark the variations of the plumb-line. But it is useless

to describe particularly, what every one is acquainted with. Different persons use different levels, though this I think the most convenient. To be certain that your level is correct, take a plank and adjust it so, that the plumb-line falls in the centre: if on reversing the level, or turning it, it still falls on the centre, your level is true, and may be depended on. I will here state that your trenches should have a fall of about $\frac{3}{4}$ inch in 12 feet, or the span of the level. Some persons prefer more fall, in order to prevent the trenches from filling up; but it is a great mistake, as *ceteris paribus*, the more fall, the more apt they are to fill up. Where there is much fall, the dirt is carried away, and where it comes to a place where there is less, it will of course be deposited, and fill up the trench. It is then the accuracy of levelling, and not the quantity of fall, which prevents the filling up. To prove this, a spade ditch, running down a steep hill, where there are inequalities of descent, will fill up. Three fourths of an inch may, therefore, be considered a very ample fall in 12 feet. Having made your rafter-level, and adjusted in your mind the necessary fall you should have, you are ready to proceed to lay off your trenches.

Your hill-side for instance, is somewhat steep, and measures 100 yards from the top to the bottom, with a valley running up on each side. About 30 yards from the top, equidistant from the drains on each side, you take a station—commencing there with a level, you lay off a trench (with the necessary fall) to the drain on the right, making marks with the foot, or in some other way, as you go along. You then return to the point from which you started, and proceed to the drain on the left. The water is then let off in different directions—thus avoiding the great accumulation of water which would take place in one long trench. You then pass down the hill 30 yards farther, and lay off another trench in the same manner—and so on for the third. Where you have to go a long distance to get a bottom to empty the water, it might be in some instances adviseable to make a straight spade ditch 3 feet by 2, right down the hill to receive the water of all the trenches making into it. You need not be afraid of a gully. Gullies are formed by the pouring of water down the sides; and the trenches avoid this. The natural tendency to fill up, will pretty nearly counteract the effect of abrasion at bottom.

Having laid off the trenches, the next step is to make them, and which is done in the following simple manner. The leveller having previously marked the line of the trench, walks upon it, with an accurate ploughman with his plough following him, making a furrow where the trench is to run. Three furrows should then be run below, with a large dagon plough, the mould-board on the upper side, and 4 above, with the mould-board on the lower side—they should then be opened with hoes, drawing the dirt of the 4 furrows on the three below, which makes a good solid embankment, with a trench about 3 feet wide at bottom. This work is done with great ease and despatch—one hand being able to accomplish in a day 200 yards. It may be as well, however, to observe here, that some very judicious men, (among the rest, Mr. Skipwith,) are in the habit of making their trenches with the spade, 3 feet broad and 2 deep. This, however, increases the labor four-fold, and is, I think, of no real advantage. The difficulty of passing them with wagons and carts, is a serious evil. You have bridges to build, in order to cart your corn and small grain over them, which would require a quantity of labor, that few farmers could afford to bestow. I must repeat to you, that every thing depends on correct levelling.

This system of correct trenching, will be of incalculable value to those who cultivate broken lands, and this class must embrace a large portion of the farmers of Virginia. Three years ago, there were scarcely as many persons who practised the system in this country. All the prejudices against innovation were excited against it. It was affirmed by some, that it wasted too much land: but what is the loss of one or two corn rows on a hill-side, compared with the total waste of soil, which is caused by a few years of cultivation? Others object, that it make gullies. This is the effect of bad levelling; but I can affirm, that most of the trenches I have ever seen or made, were better than none; if one gully was produced, a dozen were stopped. These prejudices have now pretty well subsided—and our best cultivators, statisfied of the great benefits of trenching, have very generally adopted the system.

JAMES C. BRUCE.

Halifax, Sept. 20th, 1833.

We believe that the foregoing letter will not require any editorial recommendation or comment, to command the attention which the subject so well deserves. But as the practice described by Mr. Bruce, has scarcely been heard of on the broken lands of the tide-water district, where it may be so beneficially introduced, we will venture to offer our opinion in favor of horizontal ditching, though it will be useless, if not obstrusive, to all who have more experience on this subject.

Proceeding upon very imperfect verbal information, then recently obtained, as to the manner and the benefits of this operation, we tried a ditch of some 500 yards in length, on a slope cultivated this year in corn, which had been very much washed and gullied by heavy rains under former tillage. The repeated heavy rains during the summer, tried well, and established satisfactorily, the efficacy of the plan. The labor of making the ditch with the plough was inconsiderable; it caused but little inconvenience in the subsequent tillage; and the plan effected all the benefit which has been promised, but not obtained, from the difficult and inconvenient horizontal ploughing for corn, in beds and water furrows.

The damage caused to all our broken lands by the washing away of the soil by rains, has been much greater than all the exhaustion by the growth of crops: and to arrest this agent of destruction, even at this late period, will be of incalculable benefit to our country.—ED. F. R.

ON ATMOSPHERIC INFLUENCE, AND ON THE IMPORTANCE OF PROPERLY PREPARING LAND TO PROFIT BY IT.—*By M. Bastide d'Izars.*

Translated for the Farmers' Register, from the *Journal d'Agriculture etc. des Pays-Bas.*

I set out with these principles; first, that caloric, water, and the atmospheric gases, contribute to vegetation still more than earth, (vegetable mould excepted;) that this earth which bears the plants is little more than the matrix in which the combinations of the alimentary substances are more or less perfectly effected: second, and consequently, that unfertile lands are so, principally because they have too much or too little density or porosity, that is to say, that they receive or preserve too abundantly, or in insufficient quantity, the atmospheric influences: third, that on such lands, the object is to pulverize the one and render the other more compact: fourth and last, that this operation should precede the use of the various manures, or proceed simultaneously with it.

I shall not stop here to prove the above principles in detail, but they are those of the best authors, and I have adopted them because they are daily confirmed by my experience. Yet, a considerable number of agriculturists still believe that the earth nourishes the plant, as bread supports man, and that the unproductiveness of a soil should be attributed to its natural deficiency in alimentary resources. The addition of animal, vegetable, and mineral manures giving generally more or less vigor to plants, these agriculturists, from this circumstance, conclude that the atmosphere has no share, or but a small share in vegetation. Yet, how many facts combine to prove their error!

The atmosphere, in the acceptation which I here give it to you in speaking of its influences, contains the air, the water, the caloric and carbon which are found in it, always combined with oxygen. This atmosphere, the good and ill effects of which are unknown, has many constituents in common with plants and manures, as is proved by subjecting each to an analysis.

In a vase containing a certain quantity of earth, you behold that beautiful tree; it weighs many hundred weight, yet the earth which bears it has perhaps lost only one or two ounces: the manure it has received has not supplied all the weight of the tree, for it would have attained its growth, less rapidly indeed, yet it would have grown without the manure: but it has been watered, it has respired the air which surrounds it, &c. At Marmande, near St. Martin du Touch, a willow root insinuated itself into a large circular subterranean conduit designed for irrigations, at the outlet of a fountain. There it acquired such a diameter as entirely to close up the conduit for a distance of many metres; yet there was in the conduit no more than air and running water. The air and the water then, in this case, nourished the growth of the willow root to its gigantic proportions. Beans have been cultivated without any earth--bulbous roots live in vases of water on our mantel-pieces, &c.; these are the facts which support my first principle.

What is obtained from lands in an excess of rain or of drought, or in uncommonly cold or unseasonably foggy weather? What land is good enough and sufficiently well manured to return a good product in such cases?

Give me the management of your best soil, rich in vegetable mould and calcareous matter. I will harden it by means of a mall, or render it close and compact by trampling, or by two wet a ploughing: what will this soil produce? Or shall I adopt a course directly the reverse? I will mix with the vegetable surface a quantity of very dry and coarse straw, and bits of hard brush wood laid crosswise, which, acting as levers, to a certain depth, will prevent the roots of the plants from being seasonably moistened, and will leave them naked and exposed to heat and cold; and again we shall see what can be produced by the unassisted excellence of the texture of the soil. Two or three years ago, Professor Dispan took the trouble to put into some vessels, for experiment, portions of earth taken from my lands, and from which, notwithstanding the aid of marl, compound manures &c., I have never been able to derive any advantage. M. Dispan, without the addition of any manure, but by pulverizing, by paring and burning, (*ecobuage,*) by a mixture of sand, and by simply watering it at proper intervals and in proper proportions with pure water, has obtained from this land satisfactory products of wheat and maize for two years; and the wheat which he has sowed on it this year is really astonishing for its beauty; it would be supposed to grow in an excellent soil. So much for my second principle.

When a soil is too porous, too pervious, the rain water filters through it too rapidly, and the roots of vegetables cultivated on such a soil die of thirst during a drought. The stalks, the branches, the leaves, the whole plant suffers; the fruit is not formed or it is imperfect; the sudden changes of temperature are very pernicious to plants so situated. A vine that has been worked, but without laying its roots bare, on the evening preceding a hard frost, suffers ten times as much injury as another not yet touched; and soils naturally too porous are always in this disadvantageous condition in which this vine has been accidentally placed. last summer all my clover, sowed in October and November 1825, died, leaves, stalks and roots, while that sowed in 1826 withstood the drought. I grant that a plant which has only a year longer to live, is more exposed to unlucky accidents than another which has still two years to continue; but I particularly attribute the dying of my old clover to the greater porosity which it gave to its soil; thereby rendering the drying of the earth quicker, more complete and more fatal. The proof of this great porosity, resulting from the continued growth of clover, lucerne and other plants with tap roots which occupy the land for several years, I derive from the thirstiness of such soils, which is so great, that during the heaviest rains, there seldom remains a drop of water on the surface; while similar lands sowed in wheat, for example, are overflowed by the same rains.

Soils which are too close, have the defect of not permitting the growth and suitable direction of the roots of plants. Lucerne sowed on my land grows well, and dies within the year. On digging into the earth below them, their tap roots are found deviating from the perpendicular direction, branching into forks, taking an unnatural course, and exhausting the vicinity. These compact soils, once dried, require a long time to become wet; and once wet, are always very slow in drying: and in many instances these delays are prejudicial to the

labors required by the soil, and to the products expected from it. These are the proofs of my third principle.

The fourth position is only a corollary from the preceding; for it would be a mere sacrifice of manure to bestow it upon land ill prepared for producing.

If the foregoing principles be admitted, and if the whole of my deductions from them cannot be controverted, it is then important to seek to correct, as much as possible, the closeness and lightness of a soil, to a sufficient depth. I say to *a sufficient depth*, because the inferior strata have a great influence on vegetation, the phenomena of which, we observe only at the surface. This being assumed, soils of too much porosity should be seldom ploughed, and almost solely to clear them of noxious herbs. They will suffer little from wet ploughing, which bakes the land and is generally so pernicious;—I should even expect some advantage from it on sandy soils. The most compact manures will be best for such lands; mud from ponds, strong, rich dung, and clay; the drains for carrying off rain-water may also be less carefully opened.

Lands too close, like most of mine, should receive dressings of sand and mixtures of long, coarse, unrotted litter. Paring and burning should be resorted to; but as these modes of improvement are frequently ruinous, or at least beyond the means of the proprietor, it is by frequent and deep ploughings that we should attempt to pulverize such soils. This is the point to which I would direct the whole attention. We know all the existing ploughs, with their improvements; but not one has been constructed with the single object of sinking and keeping its share at the greatest required depth, for all are designed to turn the land more or less. So, in practice, I know no instrument of tillage for opening soils during a drought.

I should require then such a tool that all the drawing force might be employed in depth. It should make in the earth only a split or cleft vertical to the surface, leaving a given space to separate this split from that which is to be made on the return of the instrument; the horses going, as in ploughing, from one end of the field to the other. After passing over the field in one way, the work should be repeated at right angles to the first, so as to divide the land, like a chess board, into spaces of about a foot square. The original cohesive force of the soil being thus once lessened, good turning ploughs should be worked to a great depth. What was impossible, will be only more or less difficult. Then an energetic proprietor will succeed in important improvements which manual labor is insufficient to effect on a large scale in lands like mine.

BEDFORD SOILS, AND CULTURE.

We are indebted for the following communication to the late editor of the Virginia Farmer, to whom it was addressed, and who, on declining the publication of his agricultural journal, has sent this answer to some of his previous inquiries, to be published in the Farmers' Register.

Liberty, Bedford, Va. 7th Sept. 1833.

To Theoderick McRobert, Esq.
Editor of the Virginia Farmer.

Dear Sir,—The post master at this place has placed in my hands a printed circular received by him some months ago from you, requesting information respecting "the present state of agriculture," &c. and respecting "the soil—the kind of soils—its capacities for improvement—the kind of crops cultivated—the progress of improvement in agriculture generally," &c. &c. And the post master has requested me to write you, giving the desired information, &c. It would afford me much pleasure if I possessed the requisite information, and had leisure and capacity to answer your interrogatories fully and satisfactorily; although a true account of the state of agriculture, &c. in this county generally, would present a gloomy picture. It would also be mortifying, even to my countymen, who are from habit so familiarized to the wretched, slovenly and injurious manner of cultivating the soil in many parts of Bedford, that although they would notice and condemn them if seen abroad, yet they at home attract no particular attention. Nor are truths always the most palatable when they relate to our own indolence or negligence.

The present state of agriculture generally in this county, is a very bad one; and in some particular parts of the county, the worst I ever saw. There have been some particular periods, when from particular causes, such as the extreme low prices of tobacco, (our staple commodity,) and a rise in the price of wheat, corn, &c. the country would for a short time present the appearance of an obvious change for the better. Then there seemed to be less tobacco reared, and more grain of every kind in the fields, and more clover and grass of different kinds sown, and more plaster and manure generally saved and used, and more attention to the buildings, enclosures, fixtures, &c. generally on our plantations, and more attention paid to judicious ploughing, (the very life and soul of good farming,) and to raising more stock, particularly horses and hogs. But soon, too soon, a little depression in the price of wheat, and a little spur or rise in the price of the tobacco crop, and the scene by the next year is greatly changed; and in traversing the county, you see all the best land on almost every plantation cultivated in tobacco, and every thing like making and carefully saving manure, and applying the same to the grain or grass crops, neglected. The enclosures seem to be utterly neglected, and go to wreck; and a total neglect of every thing like improvement in soil, or in the mode or manner of ploughing, and in the prudent application and distribution of manure, except on the tobacco lots, are neglected; and the whole energy and industry of the plantation seem to be employed in bettering the quality, and increasing the quantity of tobacco.

This is the more lamentable as I do conscientiously believe the Bedford lands generally are, from the nature and quality of the soil, and from its lying generally on a fine, firm, compact and close substratum of clay, are susceptible of as high a state of improvement (by prudent and judicious management) as any county in this renowned commonwealth.

'Tis true, there are some few local situations, where there seems to be no good clay foundation,

and where manure of any kind seems to sink, and its effects to disappear in a few months, and which it seems cannot be much enriched. But these spots are few, so far as my knowledge of the county extends, and are comparatively very small. And the great mass of the Bedford lands are comparatively good, and susceptible, by the proper and prudent cultivation of clover, peas, and other shading, succulent, and nutritious vines and grasses, and by the use of plaster and other manures, of the very highest improvement. Our soils are various in many respects; and among the best in the county, is what is commonly called a mulatto soil, of a dark brown complexion, abounding in black oak and hickory, black gum, locust, dog-wood, poplar, &c. on which is made much of our fine tobacco, and after two, and even three crops of that plant, is wonderful for wheat, corn, rye, oats, potatoes, flax, buckwheat, peas, and sometimes hemp (which latter is not often raised here.) This kind of land is sure to have the foundation I have above described, which is as close and tough as you can well imagine, and holds manure or water almost like a bladder: and on such, although old, much worn and exhausted, where a load or two of stable manure has been spread and ploughed in before the scorching sun and exhalations have in a great measure destroyed it, its effects and benefits are most obvious and visible on the crops for five, ten, or even fifteen years.

In much the larger part of our county, the rotation of crops, (if such it deserves to be called,) is to cultivate the same soil in tobacco two, and not unfrequently three years; then wheat, rye, or oats; and regularly thereafter, corn or small grain of some sort, in constant succession as long as it is worth cultivation; and if it happens ever to get one year's respite, it is during that year so wofully pastured and grazed by stock, that one year's rest in that way, leaving it more than ever bare and exposed to the scorching sun, and so trampled by the hoof, that 'tis the hardest year it has ever had. There are, 'tis true, exceptions to this ruinous course of cultivation, and I must say they are increasing: and there are some who have recently commenced a much more prudent and improving system—and at present there are more clover seed and other grass seeds sown, and more plaster and other valuable manure made, and more horizontal and deep ploughing, than heretofore. Indeed, we have some as fine looking clover fields, and which when well manured or plastered, affords as fine crops of clover as I ever saw beyond the Blue Ridge in the limestone country; and I have heard some Botetourt farmers express their surprise at seeing (this side of the mountains,) such fine clover fields, and that they were equal to, and often better (in wet seasons) than any they had seen in their county; and at the same time declare they had no doubt this county was as well adapted for improvement of its soil as any county in Virginia. But generally, our ploughing is wretched, and done in any other way than horizontal, and so shallow, as only to loosen enough at one ploughing of a corn crop for the first hard rain to carry all off that is loosened, or for the sun effectually to kill and parch up the little thus turned over or broken up. There is yet in the minds of many men of ordinary intelligence, a strong prejudice against deep ploughing, and a belief that it will soon entirely destroy the soil.

Bedford is one of the principal tobacco making counties in Virginia, and yet there is a good deal of wheat raised in the county, but 'tis mostly on corn land, and such as will not produce tobacco well. And yet there are happily some who fallow pretty extensively for wheat, and 'tis much to be hoped the prices for the two last crops may increase its culture. It is with deep regret I must add, I have not known one bushel of good clover seed raised and sold in market in this large, populous, fertile and wealthy county.

An agricultural society was probably formed at New London, mainly by citizens of Bedford, on Saturday last, as a meeting was to be held there for the purpose. To all such, properly conducted, I say God speed them and their efforts: and I hope, ere long, we may have one here, and at other places in the county, to which end I hope your Virginia Farmer may largely contribute.

W— C—.

ON FENCING AND OTHER ENCLOSURES.

To the Editor of the Farmers' Register.

Columbia, S. C. Oct. 5th, 1833.

In order to add my mite to the great exertions now making by your correspondents, and particularly by yourself, for the promotion of agricultural interests in our country, I thought the great need to our country of permanent or at least durable enclosures would cause such hints as I might give, to be tolerated in your most valuable periodical, "The Farmers' Register." If you think so, I beg you will insert the following desultory observations.

It will not be disputed, I hope, that for the successful prosecution of any business whatever, due preparations in buildings, implements, &c. of the most durable and commodious kinds should be provided, and that the first expense ought to be incurred with judgment, but without stint, or fear of spending a few dollars more or less. We should always keep in mind that it is much more economical to lay out one hundred dollars for a useful thing than fifty dollars for one that is useless, or nearly so.—Make-shifts have always, I believe, been found the dearest way of proceeding to business, and should never be resorted to except in cases of the most absolute necessity. One of the things in which we fail most generally in our country establishments, is in the due enclosing of our fields. The common worm-fence is certainly soon made, in a new country, where there is an abundance of choice timber for the purpose; but we all know, that except in very few favored situations, where the timber is of superior durability, such a fence answers but very imperfectly the object it is intended for; and that after a few years of continual trouble, in driving pigs and cattle out of the field and repairing the fence, it must be made anew. The post and rail fence is better, particularly where durable timber is easily obtained for the posts; but still, wood decays so rapidly, that I am certain it is much more economical to make at first a durable fence at double the cost, and that in a few years it will have proved the cheapest. The next best thing is live fences, and here also there is a considerable difficulty in the selection of the most suitable plant capable of answering the purpose most fully. There is scarcely any one plant that is not liable to some objection; we must, there-

fore, be careful to select that which has the least. The Nondescript, Cherokee Rose, the *Rosa Leonigesta*, of botanists, is used for hedges in South Carolina and in Georgia, where it has, in some places, succeeded admirably well, when in others it has failed. This failure may have arisen from the unsuitableness of the soil, the want of due care in the course of the planting and cultivating it when young; but more particularly, perhaps, from the aptitude of the rose tribe to die when least expected, without our being able to discover the cause. One of the objections to it is, that as a hedge, it covers a great deal of ground, and that cattle are fond of eating its young shoots. I have no means of judging whether it would thrive as far north as Virginia. It grows admirably well on the banks of low rich grounds, and wherever the soil is not very poor and dry. It is usually propagated by cuttings, which ought to be planted in the fall, and some say also in the middle of summer. The mode of raising it from seed would probably be preferable where the seed can be procured; but it is not easy to get it. I have not succeeded well with it, and I am inclined to give the preference to the *Mespilus Pyracanthus*, called in Europe, Burning Bush, (not the plant usually so called in this country, which is the Spindle Tree, *Enonimus Americanus.)* The Mespilus has very strong and sharp thorns, is an evergreen, or nearly so, and has the great advantage of never becoming naked at the bottom, and that its lower branches which grow horizontally, very readily take root. This last property gives it also a decided advantage over all the other hedge plants that I know of, except the Cherokee Rose, which is, that in planting the young plants for a hedge, they will be close enough at two feet apart, and even farther, if the ground is tolerably good; for the lower horizontal branches by being covered with a little earth will readily take root, and completely fill the spaces. Add to this that when the hedge is sufficiently full, two or three of these horizontal branches from each original plant may be layered and covered with a little earth, and taken up the following year, when they will be found to have good roots, and be sufficient to plant a hedge two or three times the length of that from which they are taken. It is usually raised from seed which it produces in the utmost abundance. It may also be propagated from cuttings planted in a nursery of good soil well prepared, when they may be removed to their final place of destination. It grows well in all sorts of soil, as far as I have tried it, and, like most other things, it grows best in good land well prepared to receive it. There are many other plants that are used, and still more that may be used for hedges; but I need not enumerate those best known and in use. A plant that is still too rare to be made into hedges with the probability of complete success, is the *Maclura Aurantia*, Osage Orange. It is very hardy and strong, with very sharp long spines. I am informed that, with due precautions, and planted in a good soil well prepared, cuttings of it take root very readily. If so, it may be easily propagated, and may prove very beneficial.

Hedges are certainly far preferable to wooden fences; but yet they are liable to many faults, and require very constant attention, and frequent work, to keep them safe, and a full protection against the intrusion of cattle, and particularly of hogs. When a farmer intends to do his duty to himself and to his fields by cultivating them properly, and gradually improve them in fertility, it seems to me that it is well worth his while to surround them in a more permanent way than can be done even by a very good hedge. A stone or brick wall may be thought too expensive, and so it is for a field that is yearly deteriorating; but where the materials are convenient, it would most probably be found in ten or twelve years to have been the cheapest. In some countries, enclosures are made of earth in a mode called in France "pisé," where I have seen handsome large houses, churches, &c. that had been built of this cheapest of material upwards of two hundred years before. I am informed it is also the practice in many parts of South America to build walls and houses in pisé, and that their strength and durability are almost incredible. The best earth for this kind of work is that sandy or gravelly soil that contains just enough of clay to make it adhere together when pressed in the hand, so that after a slight pressure the marks of the fingers are imprinted in it, and the lump thus pressed does not fall to pieces without its being acted upon with some slight blow or lateral pressure. The full description of the manner of building pisé houses and walls is to be found in one of the volumes of the American Farmer of Baltimore, in Rees' Cyclopædia, and also in the Cours Complet d' Agriculture of the Abbe Rozier. It may probably be also found in several other books. This mode of building must not be confounded with what is called mud houses, which are inferior in every respect; for I am satisfied, that a pisé house well constructed of good materials, is at least as good, and as strong and durable as one made of brick. There is neither water, nor hay, or straw necessary to be mixed with the soil used; on the contrary, great precaution ought to be taken not to leave in the earth any vegetable substance at all, not a blade of grass, a straw, or a fibre of root. The reason of this is obvious; for vegetable substances will in time decay, and will thereby leave a weak place in the wall, or a want of connection of the earth. Water added to the earth prevents its being well pounded, and, in evaporating, may occasion cracks in the wall. The easiest and cheapest then is the best, and the earth such as is usually found about a foot or so below the surface, is in the best state possible. As soon as it is dug, it is thrown between two sides of planks forming the mould, which being properly secured from spreading open, so as to form irregularities in the thickness of the wall; this earth then being put into the mould, to the thickness of four to six inches, is then pounded down with wooden pestles made for the purpose, until they no longer leave a mark on the pounded earth; more earth is then added, and again pounded, till the mould, which is about three feet broad and ten feet long, is filled to the top, and being loosened, is moved along the line of the well, when the process of pounding the earth goes on as before, and so on till the wall is made. This is a very imperfect and insufficient account of the manner of describing the building with pisé; but I only meant to give an idea of the thing—for it requires plates to render it fully intelligible. It is, however, very easy, and such as can be done by any negroes under the superintendence of an intelligent man. A house or wall constructed in this manner, forms one solid mass without joints, and,

if the earth did not contain too much clay, it will dry perfectly without the least crack, and be very nearly as hard as stone. A wall sufficient to enclose a field or garden, &c. may be made of the earth taken out of a ditch along side of it, taking care to throw away the surface that contains vegetable matter. So that a wall of this kind is made certainly at a less expense than would be required to dig clay, temper it, and mould it into bricks for the same wall; besides which, the expense of burning the bricks, hauling them, and laying them, are all saved. It is much more convenient to have the foundation of such a wall laid with brick or stone for four to six inches above the surface of the ground; but I have little doubt that a way may be contrived to build it altogether with pisé. Such a wall should have a coping of stone, brick, tiles, slates, shingles, or thatch, or boards; but experience will no doubt discover some cheap method of covering it, though by shaping the termination of it like a roof it would last many years without any covering. For building a house of this sort, if a cellar is wanted under it, dig the foundation the depth intended for the cellar, build it up with brick or stone to about one foot above the surface of the earth, and take the middle part of the earth for the purpose of raising your walls on the brick or stone foundation, and by a little experience it will be found that a very good house may be constructed at a very small cost, saving hauling, &c. A house built in this manner, if intended for a dwelling house, may be rough-cast outside, and plastered inside, and may be made as handsome and elegant as any house built of any materal. For out houses, such as barns, stables, &c. as also for walls of enclosure, a thick white-wash of lime is sufficient. This is applied with a broom, beginning at the top. This looks rough, but it makes a very durable coating. I have read an account of such an enclosure of several miles in length, in South America, that had no coping, and had lasted so long that the oldest man in the country declared that when a boy the wall was then an old structure. Although it was not very sightly at the time it was seen by the inquiring traveller, it was yet an effectual fence, notwithstanding the want of a covering to protect it from the very great rains of that country. It appears to me from the truth of the above remarks, that where rail timber is not abundant, and has to be hauled any distance to the field to be enclosed, that a pisé wall would be the cheapest, and that it will be found so, particularly after the hands have acquired some expertness in this kind of work.

N. HERBEMONT.

ON THE CULTIVATION OF INDIAN CORN.

For the Farmers' Register.

Indian corn is the most valuable crop made in every part of the United States, both on account of the superior qualities of that grain, and of the greater quantities in which it is made. It is remarkable that this plant should grow to such prefection over so many degrees of lattude, and through such various climates. But though every farmer, or tiller of the soil, in our country, is a cultivator of corn, and though it forms the principal crop of most of them, still the proper mode of cultivation is as little known, and the opinions thereon as much disputed, as almost any agricultutal question that can be named. Operations the most opposite find advocates and practitioners, and success in the result has been boasted as the proof of the value of every method practised. Deep or shallow ploughing—a ridged or level surface—and various other peculiar practices, have each been considered by some as indispensable, and by others as injurious to the greatest product of corn. Our ignorance does not arise from the want of instructions in sufficient number; our agricultural publications offer to our choice scores of opinions and methods, and in the practices of farmers, we may find a still greater variety. I shall not attempt to point out the best mode of cultivation—but rather to seek it, by inquiring into the causes of this diversity of opinion and practice, and endeavoring to show, and to remove some of the impediments to the forming of a sound theory, and thence deducing correct practice on this subject.

When a man is thrown into a situation altogether different from what he has been acquainted with before—whether from a change of country and climate—of products—or, of his own habits—he, from necessity, yields to his new circumstances, and endeavors to accommodate his habits to them. He loses all the benefit of experience—but he takes *reason* instead, as his guide; and it often happens, that this guide leads to truth and correct practice, more surely than all others. When our English forefathers first began to cultivate the forests of Virginia, they found every thing so entirely different, that they were obliged to abandon all their former practices, and learn anew, from the exercise of judgment and the instruction afforded by necessity. They adopted a mode of cultivation well suited to their new circumstances, in which they showed far more judgment than have their descendants in adhering to the same, after all those circumstances had changed, or disappeared. Under the like necessity, the new settlers of the western states now act, who never think of continuing the practices on the long worn and poor fields which they left in the land of their birth.

But, in general, farmers do not thus exercise their reason, except under the compulsion of necessity; and when circumstances change gradually and slowly, they do not change their practice in conformity, but cling to their old (and once judicious) practice, until it has become manifestly unprofitable, and absurd, to every one who is not thus *blinded* by the light of experience.

When our forefathers had to plant corn entirely on newly cleared forest land, incumbered with stumps, and filled with roots, they wisely made the tillage very superficial, made but little use of the plough compared to the hoe, and heaped the scanty loose soil in *hills* around the stalks, in preference to a more laborious breaking of the whole surface. The soil being kept open, and in some degree of tilth, by the rotting roots of trees, did not much require more perfect tillage—and for the labor expended, (the land costing nothing,) this was the most economical and most profitable culture. But these habits gradually became fixed: and before the publication of 'Arator,' the general mode of cultivating corn through lower Virginia, did not vary very much from the old *new-ground* practices. Indeed much of it is still remaining every where: and, even after a farmer has adopted a different theory, he will not be able in many years to get his overseers and negroes out of all their old movements.

On a light, clean, and well pulverized soil, we often see a mark made to plant the grains of corn, by a plough suited to make the *only* furrow through a new cleared soil: and to cover the grains, dropped in the *trench* so opened, three or four strokes of a heavy hand-hoe will be applied. If such unnecessary motions are forbidden, the negro will still lose more time in letting them alone, than it would require to perform them. But with most persons there is no disposition to escape from the slavery to old habits. To cause any process to pass unquestioned, it is enough that it has been always performed.

The subjection to old opinions and to experience (as it is called,) is by no means the only bar to improved cultivation. Many have completely shaken off the yoke, and not a few of them have published their new opinions for the guidance of their fellows. Some of these plans have been found to be altogether visionary and unprofitable, and have served to increase the existing prejudice against all changes. Others were founded on correct views, and were judicious and profitable for particular cases; but like quack medicines, each new mode of cultivation has been pronounced, by its advocates, as proper under all circumstances; and it is therefore not strange, that more of loss than profit should attend its general adoption. There can be no reason to doubt the value of Taylor's ridge and furrow mode of cultivating corn, on deep, sandy soils, having a level surface, and where wheat was comparatively an unimportant crop; but no more ruinous plan could have been adopted on thin and poor soils with a hilly surface, or on broken wheat lands.

It has been said, that the whole theory of tillage, or the objects of agriculture in general, may be expressed in these few directions: keep the soil dry, (or free from superfluous water,) rich, in tilth (or loose and open,) and clear of weeds. Applying the same to corn, it may be said, that whether the soil be rich or poor, sound theory merely requires that the soil should be dry enough, clean enough, and sufficiently broken and pulverized. The difficulty is in fixing the degrees of sufficiency, and in varying the means for producing them according to every change of soil and other circumstances. Nothing is more ridiculous than the quackery of giving precise directions for the tillage process of corn, even to prescribing the number of furrows, and the particular implements to cut them, without regard to the difference of soil. Yet we have often known the most implicit obedience given (or attempted to be given) to such rules, and in situations entirely unlike. Even if the best possible mode for cultivating corn, in any one situation, could be discovered, it would require to be varied with every considerable change of soil: and even on the same soil, an alteration of its fertility, and its growth of weeds, might make a particular mode of cultivation good at one time, and very improper ten years after. It is not only that different cultivation is required by sandy, clayey, and stony soils—level and hilly—in a dry or moist climate—infected with indestructible weeds, or free from them—but the succeeding crop, and the general rotation must also be considered. For example—after corn arrives at a certain state of forwardness, it becomes doubtful whether additional ploughing will do more harm, by breaking the roots, or good, by killing weeds and pulverizing the soil. Under this doubt, we who follow corn by wheat, must risk the damage of ploughing, to secure the benefit of having a cleaner seed bed for wheat; and it would be proper to let alone that ploughing, wherever corn was not the preparing crop for winter grain. Again—the blade and top fodder of corn are important and indispensable products in Lower and Middle Virginia, but are not much valued in our best grass counties. In the former case, it is proper to gather the fodder as soon as the grain will bear the operation—and in the latter circumstances, no risk to the grain should be encountered for such an object. For want of knowing when this operation may be safely performed, or for neglect in enforcing what he thought a safe rule, every farmer among us is a yearly loser in grain; and sometimes to an extent not much short of the whole net profit of the fodder harvest. However, no one has thought of estimating losses of this kind, nor the profits of the fodder crop, because we have been always used to the practice and its losses. We spend from three to four weeks without grudging, in securing our fodder, even when we cannot spare a fourth of the time to cutting hay on our meadows; and leave fields of fine grass to rot, (not intentionally, to manure the soil, but) for want of time to mow even a small part of them. We submit, without complaining, and without thinking of seeking relief, to the heaviest burthens that we have been used to, and will not bear the lightest, not already experienced.

I hope that every reader of the Farmers' Register who can give useful information on this subject, (and there are very many who can,) will do so; and in stating or recommending his plan, that each one will also state on what kind of soil, and under what circumstances it has been found advantageous. It does not follow that a mode of cultivation is admissible only in one situation: but if we are told the precise circumstances under which it succeeded best, we may judge, with something like correctness, what other circumstances will suit as well. Few novices consider that they need this information more than I do, after twenty years of experience as a corn raiser, and nearly as many changes in some part of my mode of cultivation. At one time, and for a continuance of five or six years, I thought that I had fixed on the best kind of tillage—and I still think so, for the circumstances then existing; but later circumstances have compelled me to change my cultivation, and have left me to preach what I no longer practice. This confession is not calculated to attract confidence. Nevertheless I will proceed to describe my plan.

The greater part of my farm was poor, sandy, and hilly—had been much injured in former times by the washing of heavy rains, and still more by the adoption of Taylor's mode of cultivation, although care had been used to direct the ridges and furrows in the best manner to lessen the danger from heavy rains. The injury sustained from this cause was enormous—and with every subsequent care, has not been, and perhaps will never be, entirely remedied. To avoid the washing away of the soil, now became my main object, and that object led to the plan of perfectly flat tillage.

The old practice on my farm, (and which still prevails through a great part of Lower Virginia,) was to break up the land so as to leave the surface level—to mark off the distance for planting by

rows 4½ or 5 feet apart, running north and south, and crossing them with others, at such distance as left 18 to 20 square feet for each stalk of corn. Four or five ploughings with a trowel plough were given, first in one direction, and then crossing, cutting about three inches deep, and two and sometimes three *hillings* with the hand-hoe. This heaping up of the earth around the stalk, was done not only to smother the grass, but to support the stalk, and keep it from being levelled by storms, after the ears were formed. According to this plan of cross-ploughing, the furrows were obliged to run down every hill-side, and the washing was not much less than upon Taylor's plan. But if impassable gullies were not opened by a single rain, another ploughing speedily followed across, which filled up, and in a measure, concealed the track worn by the water. Thus, though there might be as much loss of soil, it was less perceptible; and we were content to be thus reduced *gradually*, from a rich soil to a barren and naked subsoil.

After abandoning first this, and afterwards Taylor's system, I introduced, by degrees, the cultivation which I shall now describe.

My fields were not grazed, which made them foul, and increased the difficulty of ploughing, although poor. The weeds and grass, however, were nearly all dead above ground in the winter, and there was almost no living turf, or sward.

The field was ploughed flat, and four to five inches deep, in the winter. In the spring, the rows for planting were marked off very accurately 5½ feet apart one way, and across them at 3¼ feet. The seed were planted in the crossings of these furrows, and to insure the greater accuracy of position, very narrow furrows were made. These were marked off, not by a plough and *setting poles*, as is usual, but by a *marker*, made like a horse-rake, which made two of the wide rows, or three or four of the narrows ones, at a time. If the land was not soft, and in tolerable tilth, these marks would still need opening and straightening with ploughs; but even if that was necessary, there was much time saved in getting rid of the moving of setting-poles. After one straight row was made, for the marker across a field, all the others were made by keeping one of the outer wooden pins, (which were 2 by 4 inches at bottom,) in the outside mark, and thus tracing as many new lines, as there were other pins in the marker. The rows cannot be kept as straight as by sighting with poles; but their distance apart is more regular, which is more important.

For the principal tillage, an implement was used which very much resembled the *cultivator*, and which will be called by that name, though there was an important difference. My *cultivators* had 5 teeth; each having 3½ inches of cutting edge, which was like the edge of a broad chisel, set very sloping. The teeth cut so near to each other's tracks, as to leave no unbroken soil or grass between—and their whole *spread* was 26 or 28 inches. They swept the whole narrow interval between the corn rows, at one stroke, and the wide, at two. When land is in good tilth and clean, this is an admirable implement to keep it so—but altogether unfit for either hard or foul land.

The first running of the cultivator was given (the wide way) as soon as required, after the corn came up—and without any of the usual trouble and loss of time, that occurs when we use a plough. By running shallow, it only smoothed the surface (and nothing more was wanting, as there was no grass then growing,) and moved so little earth, that the young plants were less covered by very close cutting, than by the plough, with the farthest. In about 10 days from this beginning, (which time would be commonly taken to get through,) the second tillage was begun, by running once in the narrow intervals. This required more care, and if any corn had been planted irregularly, the plants would be cut up. The third tillage (wide way) would be finished about the beginning of June—and as it proceeded, the hoes followed to give the very little weeding that this plan required. Of course, for replanting, thinning &c. the same trouble was necessary as is usual. But the cultivators trimmed so close to the stalks, and very often threw the pulverized earth against them, that there was scarcely any space left for grass to grow on. When there was any, it was trimmed away by the hoes; but no hoe work was done where there was no grass. I have even left out a strip through the field in which no hoe was used, and no hand-weeding performed, and did not perceive that the corn looked worse. But very little labor would have been saved by this omission, and some weeds certainly thereby escaped destruction, and must have injured the crop and the land. No hilling was permitted in any case; and I have never found that my corn was, on that account, more subject to be blown down, or broken off, by high winds. When corn is laid prostrate by wind, in its growing state, it will rise again and be erect, except some crook near the root. This prostration never happens unless the earth is saturated with rain; and then its softness prevents the hill being an obstacle to the falling of the stalk, though it will be to its rising again, by the earth closing around and hardening, before the sun can raise the corn. The breaking of stalks is most apt to happen when the earth is too dry to yield—and the hill may by its resistance, cause the more to break. However, this I am sure of—that no injury has been sustained by ceasing to hill the corn.

The fourth ploughing was given in the early part of June, and was the only deep one. Trowel ploughs were used, running thrice in the narrow intervals, and cutting the earth thoroughly and close to the corn, 4 or 5 inches deep. Sometimes a coulter was used instead, (for experiment,) cutting 7 inches deep, and also going thrice in a row. From this I expected great benefit, by its enabling the earth to absorb so much rain, and preventing after injury from drought; but no difference was seen, and the coultering, being very heavy labor, was abandoned. Afterwards the cultivators again passed over the wide way, making the 5th horse-hoeing—and sometimes, where the corn was very small and backward, a sixth was given. The hand hoes again followed the last horse work, and chopped out any grass or young bushes that were found; and there was but little for them to do, if the ploughing had been well executed. If the tillage was more advanced than has been stated, the 4th might be also with the cultivator, and the 5th with the plough; but the last was always given in June, and followed by the last shallow work of the cultivator.

It required a good horse to draw these cultivators—and with such a one, they would go over 6 acres

a day. Considering the heavier draught, this was not a very great gain over the ordinary work of a trowel plough, which I have heard stated at 4 acres, in 4½ feet rows. But the latter cuts not much more than half the surface in this case, and leaves four times as much work for the hoes, as is left by the close-cutting cultivators. It is impossible that any thing like 4 acres of good work can be done by any single hoed plough, drawn by one horse.

The first running of the cultivator, is on land ploughed perhaps three months before, and with a compact surface. Then it cuts only 1 to 1½ inches deep. The next time deeper—and the third will probably be 3 inches, if there has been no heavy rain to consolidate the earth. If such a rain falls, the field should be ploughed as soon as possible after drying, for fear of getting hard; which ought not to be permitted, even if an extra tillage is thereby given—(not exceeding, however, the 6 in all.) But, if the soil, from neglect, is permitted to become hard, or foul with grass, it is in vain to try the cultivators.

I did not perceive that my crops were better than when well tended by trowel hoes, (though no accurate experiment was ever made for comparison)—but I was sure that they were as good, and the labor of cultivation far less. There was also less washing on the slopes, as the surface was kept level enough for the water to flow across the ploughing, (except that in June,) and not be confined to a single deep furrow. But still it was far from being effectual in preserving the soil, as very heavy rains would sometimes sweep off from the most exposed spots, the whole depth loosened by the cultivator.

All my old cleared land was tilled in this manner for four or five years, but I was at last driven from the use of the cultivator entirely, by the concurrence of the several reasons which I will state.

The whole of my fields had been marled during this time, and their product, on the average, more than doubled, by that and other means of improvement. One ill effect produced by making the soil calcareous, was the general commencement of a growth of either wire-grass, greensward, or blue-grass, over the fields which before were too poor, and too unfriendly to their production, to bear either. It was not that any field, or even any large portion of a field, had a turf of such grasses; but small spots of turf were scattered about, so that the plough would scarcely run 100 yards without meeting with more or less. A close turf of greensward would have been troublesome—but would have been well worth the trouble attending its management. But the little patches of it would be moved along, instead of being turned under by the plough, and remained alive through the winter. The blue-grass and wire-grass, were still less hurt by ploughing. A second ploughing could not be given to harass (for it could not destroy) the spots of turf, without giving it to an hundred times as much clean land that did not require the ploughing, and was even hurt by it, by having the dead vegetable cover brought back to the surface. But whether with one or two deep ploughings before planting, the cultivators were quite ineffectual on these spots of turf, and which were increasing in number and extent every year.

Other objections, which had always existed to the cultivators, but which, when alone, had been submitted to, now hastened my abandoning their use. I have said that great attention was necessary in marking off the rows, and in dropping the grain; and it need not be mentioned that equal care was required in the tillage. Circumstances had withdrawn much of my personal attention from my labor, and of course all these things were worse executed. Again—the making these cultivators required good *sawed* and seasoned oak timber, (to prevent splitting,) and a particular bending and inclination of the teeth to the earth, for them to cut well and easily. I had to depend on the mechanics of my neighborhood for all this work, which was badly done, and at double prices. Our neighborhood blacksmith was always a hired slave, and during all that time not one of them continued two years together. I had, therefore, every spring to take all the trouble necessary to show the smith how to make or repair my cultivators, and to pay double price, because his ignorance made him take double time. Though the field work was admirable when well done, and though a good manager could have removed every difficulty, except the turf grasses, yet I gave up these implements, and have since used the old trowel ploughs, which can get through the wire-grass, well or ill. This gives 4 or 5 deeper ploughings, instead of the former course as described, and a deal more of hand-hoeing.

Cross ploughing has been abandoned, to lessen the washing of the soil by heavy rains; and the direction of the corn rows is suited to the hilly surface, and altered when necessary, so as not to vary very much from a level; though I neither practice nor approve of *horizontal* ploughing, which I have found to be very unsuitable to the hilly land below the falls of the rivers.

My late cultivation, however, has been any thing but systematic, and I am very far from being satisfied with it. But notwithstanding the change of practice, I keep the same theory of tillage in view, and consider sufficient tilth, and sufficient cleanness from weeds, all that is required for the crop. I still avoid hilling, except where it is the cheapest mode to smother the grass, instead of weeding it off.

Candor required that I should state my having abandoned a mode of tillage which I recommended to others—and therefore it was necessary to state also, the reasons for that abandonment, which otherwise are certainly not worth consideration. It remains only for me to name the extent to which I believe this flat tillage will be found useful and economical. On all dry sandy soils, not infested with perennial fibrous rooted grasses, it may be relied on entirely; and if the surface is undulating, or hilly, so much the greater will be the advantage of adopting this plan. As an auxiliary, it will be advantageous on hilly clay soils, (which however will need more of deeper ploughing,) and on level and even bottom lands. As the latter soils would need water-furrows, of course the tillage should be only in one direction.

E. R.

For the Farmers' Register.

NOTES OF A RUSTIC.

No. 2.

In a former No. of the Register, I called the attention of its readers to the subject of ornamental trees; and noticed a few of the most remarkable belonging to this class.

In pursuing this theme, in the present No., I shall confine my remaks to a single tree, which I shall consider as regards both its useful and ornamental qualities.

The *locust*; (robinia pseudacacia) is not confined to one district—but is found more abundantly among our mountains, and throughout the limestone regions westward, till its growth is checked by the bleak climate of the Rocky Mountains.

Its appearance is an indication of a fertile, light, sandy soil, which it prefers; though it will grow on stiff, and even poor land, exhibiting however, a more deformed and dwarfish appearance and slower growth.

The height of the common or yellow locust in the regions east of the Blue Ridge, may be estimated at about 50 feet, when full grown; but it is often found in the rich plains and valleys of the west, rising to the height of 80 to 100 feet. I have seen, in one instance, two locust trees, separated but a few yards, that seemed to have attained the height of the tallest poplars, with trunks as straight as those of the white pine, and about two feet in diameter.

This tree, like most others, when transplanted from the dense forest, to open ground, has a tendency to spread its branches, and gains as much in expanse, as it loses in altitude. Hence, in its cultivation, the closer the trees are set, the taller they will grow, provided the soil be not overcharged; and they will exhibit less obliquity, both as regards the trunk and the branches.

This tree, when solitary, is generally crooked and irregular in its growth; but its deformity is fully counterbalanced by its beautiful white, and highly fragrant flowers, which hanging in pendulous racemes, among its light green petiolate leaves, render it justly admired as an ornamental tree.

For this purpose, it has been more cultivated in Europe and in our Atlantic states, than for its use as timber, although in the latter point of view, it stands pre-eminent among our forest trees. It possesses in a high degree, those most important qualities of timber, strength and durability.

Artificers in wood, necessarily become acquainted with the general qualities of the timber which they are accustomed to use—but there prevails, I apprehend, on several points relating to this subject, much ignorance, or at least, many doubts and conflicting opinions, which can be removed only by the patient application of actual experiments. For instance, the quality of timber is said to depend on the time in which it is felled—both as regards the age of the tree, and the season of the year—and yet, how great a variety of opinions prevails upon this subject. Some prefer the spring for cutting, when the sap is ascending, others the autumn, when it is descending—others with more reason, the summer or winter.

Again, the moon, which has such an influence over the *minds of some men*, is supposed to have an effect on the durability of timber. This opinion is as old as the days of Pliny the naturalist, who considered wood cut at the change, as less corruptible than that felled at other times.

But the age of the tree is, perhaps, more to be regarded than the season of the year, in cutting trees for timber.

If too young, or too old, will it not be more subject to decay, than if cut in its prime? But when is a tree in its prime? Some species, as the oak, continue to grow for several hundred years. An officer, now no more, who was in the battle at Point Pleasant, near the junction of the Great Kanawha and Ohio rivers, informed me, that he saw 80 men belonging to the army of Col. Lewis, enter the hollow of a sycamore tree. It is probable this tree had continued to grow for many centuries. But at what age should trees be felled to render their wood more durable?

The oak, which is so much used in England, in ship-building and for other purposes, is generally considered in its prime at about 80 years; perhaps, at an earlier age, it may be equally durable.

Now, if every farmer, who owns wood-land, would note the results of his own experience on the above points, it would in time accumulate a mass of facts, and would throw a light around the operations of the shipwright, the carpenter, the cabinet-maker, and every artificer of wood, and would enable the providers of timber, to procure that of the greatest strength and durability.

With the exception of the cedar, which possesses an unctuous, bitter and highly aromatic quality, which prevents the destructive effects of moisture, and preserves it from the attacks of insects, the locust is decidedly the most durable wood that our forests produce. In point of strength, it far surpasses the former tree.

It is said, that a piece of seasoned locust, an inch in diameter, has strength sufficient to suspend 20,000 lbs. weight—which is nearly a third of the weight, that a bar of iron of the same dimensions will sustain.

Hence, this wood is much used where strength and durability are required—as for ship tunnels, mill-cogs, tree-nails, posts, &c. and being susceptible of a fine polish, is applicable to many purposes, in the hands of the turner and other artificers of wood.

To the farmer and planter, the yellow locust is inestimable, and it is to be regretted that its cultivation is so generally neglected, when its use is so universally admitted.

How much labor would be saved by constructing fences of locust, instead of pine, oak, or other still less durable wood? There is no question, but a good locust fence, would last a hundred years; while every farmer knows, that his ordinary fencing has to be repaired, if not renewed, perhaps, every tenth year.

It is stated by some historian, that cedar was found in the temple of Apollo, in Attica, 2,000 years old. It is probable, that the yellow locust, if cut at a proper age, and prepared as the English oak is for ship-building by two or three years seasoning, that it would last nearly as long. At all events, posterity would have to fix the date of its decay.

Although, as I have remarked above, there is a diversity of opinions as to the best season for felling trees--it appears to me, that the mddle of summer and middle of winter, when the sap is either in the leaves or in the roots, should be preferred, for sap is the great cause of the decay of wood.

But my remarks, when I commenced, were intended to be strictly dendrographic—so I shall leave the hints which I have dropped upon the subject of timber, and return to the more poetical, if not more useful subject of ornamental trees.

Of this class, deciduous trees are preferable to evergreens—because they preserve our dwellings from the solar heat in summer, but admit it in winter, when it adds to our comfort. The variety caused by the change of the seasons in the foliage of trees, from the first budding, to the fall of the brown and golden leaves of autumn, also serves to relieve the mind from the dull uniformity of the cone-bearing and resinous evergreens.

The rich display of colors which our forests present in the autumnal months, are not less pleasing to the eye, than the varied greens of our summer groves. Orange and scarlet, and brown, and crimson, and yellow, mingle in every variety of shade and tint.

The culture of the locust is very easy—for it may be propagated, either from suckers or by the seed. Every one knows how prolific its roots are in scions, if severed from the tree:—but it is, perhaps, not so generally known, that the seed, which may be gathered in autumn and sowed in March, in a bed of good sandy loam, will come up in 3 or 4 weeks, with as much certainty as may be expected from any garden or field seeds. When one year old, the young trees may be transplanted to the nursery, and at the age of two or three years, may be set out at proper distances for ornament or use.

Locust hedges, are much admired, though, as yet, rarely, if at all, found in the southern state. This, however, is a different species, (*robina hispida,*) which bears beautiful rose-colored flowers.

W.

For the Farmers' Register.

HAMPDEN SIDNEY COLLEGE.

Anniversary Exercises.

The public examination of the students commenced on the 20th of September and closed on the 24th. During a protracted and critical examination, an unusually large proportion of the students were distinguished for their proficiency in their respective studies.

The commencement took place in the College church on Wednesday the 25th. The following is the order of exercises.

PRAYER—SACRED MUSIC.

I. *Oration in Latin,*—De Italia,—with the Salutory Address,—JOHN SHELTON, *Louisa.*

II. *English Oration,*—The influence of Chivalry on National Character,—EDWARD Y. HAMLIN, *Amelia.*

III. *English Oration,*—The proper objects of the Historian, Novelist and Poet,—GEORGE WM. POLLARD, *Hanover.*

HUSIC

IV. *English Oration,*—The influence of Skepticism on Human Character,—JOHN R. M'INTOSH, *North Carolina.*

V. *English Oration,*—Characteristics of the south,—THOMAS WATKINS, *Charlotte.*

MUSIC

VI. *English Oration,*—On Prejudice,—ALEX. S. DILLON, *Prince Edward.*

VII. *The Philosophical Oration,*—The influence of the inductive system of Philosophy, on the progress of sound knowledge,—WALTER C. SHELTON, *Louisa.*

MUSIC

VIII. Master's Oration,—HUGH P. KIRKPATRICK.

IX. Master's Oration,—ETHELBERT A. COLEMAN.

MUSIC.

X. *Degrees Conferred.*

XI. *English Oration,*—Sensibility to public opinion.—with the Valedictory Address, ROBERT G. BRANCH, *Prince Edward.*

SACRED MUSIC.—PRAYER.

The Degree of Bachelor of Arts was conferred on Robert G. Branch, Alexander S. Dillon, Edward Y. Hamlin. John R. M'Intosh, George W. Pollard, John Shelton, Walter C. Shelton and Thomas Watkins.

The Degree of Master of Arts was conferred on Patrick H. Elcan, M. D., Hugh P. Kirkpatrick, Algernon E. Coleman. M. D., and Wm. C. Flournoy, Alumni of this Institution, and on Henry J. Venable, a graduate of Centre College, Kentucky.

On Thusday the 29th, the anniversaries of the following societies connected with the institution were held in public: The Institute of Education was represented by the Rev. E. Ballantine, who gave a lecture on Classical Education, and by the Rev. Wm. S. Plumer of Petersburg, who delivered an address on the importance of elevating the standard of Female Education.

The annual address before the Philanthropic Society, was delivered by George T. Swann, Esq. and that before the Union Society, by the Rev. J. Kirkpatrick.

The Bible Society composed of the students of college, was addressed by the Rev. Wm. S. Plumer.

The annual meeting of the Trustees took place on Friday the 27th, when Socrates Maupin, A. M. was elected a professor in the institution.

PETER M. VICCAR,
Secretary of the Faculty.

BUCKWHEAT.

To the Editor of the Farmers' Register.

Although the 4th No. of the Register contains a very good article on buckwheat, I send you, according to promise, a few facts and remarks, respecting the cultivation and product of that crop. Understanding, some years past, that some farmers in Goochland and Henrico were succeeding well with this grain, I procured three bushels, which were seeded about the 25th July, on about six acres of land, which had been ploughed the winter or spring before for corn, but being detached from the other corn land, and very subject to depredations from birds, &c. was left out. It received another ploughing, and was harrowed, before it was seeded in buckwheat. A second harrowing served to cover the grain at a moderate depth. So far, the crop was well managed, grew rapidly and matured in good time—but we waited too long before it was cut, which should always be after the first frost, however slight, or before, if there is not too much in bloom. However, we saved eighty bushels of good grain, besides about ten damaged in a stack, which was given to the hogs; and a part lost by cutting after the dew had evaporated, say at least ten more, so that we made upwards, as I

supposed, of 33 for one. But none of my neighbors had raised this crop, and I had forgotten a part of the directions I had received from the gentleman who sold me the seed: your King William correspondent's directions for harvesting, &c. if I had then had them by me, would have saved most of the twenty bushels which were lost. My success induced several of my neighbors to try the crop. Some of whom suceeeded well, so that I am inclined to think that much of the high-land near the Chickahomony, is well adapted to it. I raised a good crop last year, and have seldom failed, when the ground was properly prepared, which is very necessary. Give it entire possession of the soil,—for, although it is a quick and luxuriant growth, it should not be incommoded when coming up. I have never since made so large a crop for the seed as the above—owing, perhaps, to the superiority of that season. The crop just secured is short, owing to the drought.

Mr. Edward Sydnor, near Richmond, sowed five bushels of this grain a few years ago, as he laid by a corn crop, which yielded him 100 bushels, without injuring, as he thinks, the crop, which averaged between seven and eight barrels to the acre. Here was a good crop for little trouble or expense.

I consider the 15th to the 25th July, a good time to sow.

I have generally sold what I had to spare at $1 per bushel for seed; what I had ground did not nett me more than that, after deducting the expense of the barrels, sending to mill, and thence to Richmond—but left a good profit. The demand may not justify raising large crops, but after supplying the market with flour, a part of the crop may be used advantageously at home. Besides supplying the family with a favorite article of diet for breakfast, the fowls and hogs may be fed with a part, which they will soon become very fond of, as I know of no grain on which they will fatten faster. I cannot say, from experience, that a part of the crop may be used successfully in restoring our lands; but some judicious farmers are of opinion that buckwheat sown at a proper time would make a good lay to turn in—and I have heard it is used in that way in the westen part of this state with decided benefit.

Wishing that your zeal to promote the interests of agriculture, may be crowned with abundant success.

I am, respectfully, yours.

ED. B. CRENSHAW.

Hanover, Oct. 14, 1833.

LEAVES FROM A TRAVELLER'S NOTE BOOK.

For the Farmers' Register.

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September the 13*th.*—Mr. Robert Dunn, of Oak Hill, on the Appomattox, and opposite to Petersburg, within the last two years has withdrawn his personal attention from his commercial business, and directed it to the improvement of the land and the products of his farm. He has been very successful in both, on a soil which does not appear very favorable for receiving great benefit from putrescent manures—the means here mostly used. The proper estimate which Mr. Dunn places on manure induces him to buy, as well as to make as much as possible—and his farm being within a mile of the principal stables in Petersburg, enables him to be supplied at no great expense of carriage. It is often remarked, sneeringly, of those who in this manner manure lands near town, that "with *money enough* it is an easy matter to manure well, and make fine crops on poor land,"—and with most persons, it is a sufficient objection to any mode of improvement, to say that *money*, as well as labor, was used freely to produce it. Now it cannot be denied, that much color has been given to the undervaluing of the improvement and products of *amateur* farmers, residing in or near towns, by the injudicious operations of some, and the want of such accuracy of the estimates of all, as might enable them to show when an improvement was cheaply or dearly bought. But, admitting that none are quite clear of errors and losses, in some of their applications of purchased manure, there can be no doubt of the profit of using it judiciously, to any extent whatever, while it is so cheap, and the carriage within two miles. The rich manure accumulated at tavern and other stables, (which is so much the richer to the load, from the want of plentiful litter,) in a well rotted state, is bought at 12½ cents for the heaviest load that a good horse and cart can draw—which I should suppose to be fully 14 bushels. This is the bulk of the loads of the heavier and poorer manure from the streets of New York, which the Long Island farmers pay 21 cents for, in the dock. When the stable manure in Petersburg is bought in the heap, it is often obtained much cheaper. But at 12½ cents for 14 bushels of rich stable manure, every load used judiciously, must be attended with a considerable clear grain; and the farmer who buys and uses the most, is giving better proof of his economy, than (as is usually supposed) of his amount of cash, or his spend-thrift farming. Mr. Dunn seems to be profiting well by the low price of manure—which price, however, is a sufficient proof of the low state of agriculture in the neighboring country. I think it is Marshall who observes that the price of manure is a correct standard to show the rate of advancement in agricultural improvement in any district. In the "Survey of the Southern Counties" of England, by that author, the price of manure used on the valley of Farnham, was a guinea the load—probably large wagon loads.

But much the greater part of the manure used at Oak-Hill, is made on the farm; and for this purpose, every thing that will serve for litter or manure, is carefully saved. Leaves raked in the woods are used largely. A large body of straw, which I saw, well secured for winter use, seemed to give evidence of a large crop of wheat having been made; but I learned from Mr. D. that it was all purchased and brought from a neighbor's farm at $1 37½ the wagon load. The crop of wheat was supposed, by its owner, to be equal to 1000 bushels—and the whole of the straw sold in this manner, brought him $40. Mr. Dunn had made no wheat, having no land last year enough improved, and in proper state, to receive that crop. There will be no such deficiency this fall. The field of corn, (along the turnpike-road,) shows clearly the efficacy of the manure which it received, and gives assurance that the crop of wheat which is to follow will be a good one.

The horned cattle as well as the horses and mules, are sheltered from cold and bad weather, in excellent houses, with close floors of plank for the

horses, and of stone pavement for cattle. A pit of sufficient width, and from 6 to 8 feet deep, is beneath a back door of the stable, opening from the paved passage between the horse-stalls. The used litter, &c. from the horses, is thrown out into this pit every morning, and every two or three days, is spread over the area of the pit, covered with the cleanings of the cow houses, and any other putrescent matter that may be ready, and the whole covered with a thin coat of the red clay, which forms the subsoil of that part of the farm. The dripping from the stable roof, and rain-water from adjacent sloping ground, runs into the pit, and keeps the manure always soaked, and indeed it is buoyed up by the water, so that the pit appeared quite full of wet muck when I saw it, though it would still receive much more. This mode of preserving summer-made manure, (which is usually so much wasted by excessive fermentation,) I have before thought of as excellent in theory, for the *preservation* of the materials; but I feared that the water would prevent fermentation, and prevent the manure being fit for use. This evil Mr. Dunn has not found in his yet short experience.

One of the chief objects of Mr. Dunn's care and attention, is raising young cattle of the Durham breed, which he has of pure, as well as of mixed blood. He now has some calves of extraordinary size for their age. It is a remarkable fact, that numerous deaths of cattle are caused in this neighborhood by the disease commonly called the "distemper," and in Prince George, not 20 miles distant, it is said that very few cases have been known for many years. Cattle brought from the north or west, are most exposed to this fatal disease, from which there is rarely a recovery. Mr. Dunn's cattle, as well as others, have been sometimes attacked, but he thinks that the disease is curable, if attended to immediately, and in a proper manner. His habit of seeing and observing the condition of every animal he owns once a day, has enabled him to know generally the beginning of the complaint, and to apply remedies with success. He thinks the disease to be identical with that described in "Every man his own cattle doctor," by Clater, under the name of "Red and black water;" and it is the treatment there directed, which he has tried successfully for his distempered cattle.

Saw a fine lot of mangel wurtzel. The surface certainly bore a heavy crop; but Mr. Dunn had not noticed the expense in manure, or the product—nor could he state the value as food, in comparison with other succulent crops for winter food. With pumpkins, turnips, ruta baga and mangel wurtzel, he has a continued succession of juicy food for his cows until late in the spring, when there is plenty of grass. Notwithstanding Mr. Dunn's great attention to increase his stock of manure from every proper source, he prefers to lose so much as is caused by his cattle remaining at large in the pasture, night and day, through the warm weather, except for the short time required for milking, when the cows are brought to their house for that purpose. He is satisfied that he gains more in the health and good condition of the cattle, than he loses in their wasted manure. * * * *

October 14*th*—Had a passing glance at the interesting mode of improvement practised on the adjoining farms of Mr. A. B. Spooner, and Mr. J. B. Kendall, on the Appomattox, about a mile below Petersburg. These are also town farmers, who *lie under the reproach* of making great use of purchased manures. Their peculiar practice alluded to, is double cropping, something on the Flemish plan—that is, taking a crop of wheat, then immediately sowing field peas broad cast, and ploughing in the vines (which is now in progress) just before sowing wheat again. Thus two crops, one for manure and another for market, are made every year on the same land. Mr. Spooner has tried buckwheat on part of his field, as the secondary or improving crop, and peas on the balance. I hope that one or both of those gentlemen will give the result of these practices to the public, through the Farmers' Register. Both of them are well pleased with the results already obtained, but it will require the experience of the next crop of wheat to permit a decided opinion to be formed. The heavy cover of green pea vines which I saw the ploughs turning in on Mr. Spooner's field, must furnish much manure to the soil. But I have some fears that its late fermentation next spring, will cause injury to the growing crop of wheat. I observed last spring at Brandon, some wheat growing on a late pea fallow, which was of a yellow hue, and decidedly inferior to the wheat on adjoining and equal land, which was fallowed earlier, and had been under no vegetable cover, except natural grass and weeds. The use of secondary crops to be ploughed in as manure, if justified by considerations of economy, offers an unbounded source of improvement. Mr. Spooner and Mr. Kendall have certainly been judicious in their practice in one respect; that is, first to make the land rich. To attempt to sustain or improve poor land by merely ploughing in green crops, is manifest folly: as the expense of seed and tillage is nearly the same whether the soil is poor or rich—and the green manure obtained on poor land, must be always a very light and poor dressing. But it may be, and probably is, a profitable practice, when the green crop is as heavy as can be turned in by good ploughing, and the land kept clear of weeds by frequent alterations of smothering crops, and good deep ploughings.

On both these farms, and also on that of Mr. N. Friend, adjoining, marl was in the course of application, which had been lately brought from the banks of James river, at a cost of transportation varying from five to six cents the bushel. These trials, together with others, made by enterprising farmers elsewhere, will serve to show whether so much expense can be afforded to obtain this valuable manure. Though applauding these efforts, and auguring well of the results, I would not advise an extensive application by any one person, until he has seen the result of his first experiment. Valuable as this manure is, its distant transportation has been very costly, and the more so on account of the novelty of the business, and the inexperience of those who have undertaken the digging and conveyance. Let it be established by experience, that farmers can afford to pay even three cents the bushel for rich marl, in large quantities, and there is no doubt but it will be delivered at that price any where on tide water. In the mean time frequent discoveries of new beds are making, and it will be found that many who would now buy marl, burdened by the expense of transportation for 20 miles, will find it in their immediate neighborhood, if not on their own farms. * * *

A GLEANER.

TREATMENT OF YOUNG TURKEYS.

Petersburg, Oct 4th, 1833.

To the Editor of the Farmers' Register.

It affords me pleasure to be able to supply the information required by your correspondent, [in No. 5.] relative to the management of young turkeys; and the more so, as I can assure it to be the result of successful experiment.

The principal remedy necessary in the first instance, appears to be a stimulant, to counteract the extreme feebleness which attends young turkeys, more than other fowls, in the earliest stages of their existence: hence, a grain of pepper, &c. is usually administered as soon as hatched. But instinct, their infallible guide, it appears, has more successfully directed them to the wild onion, which is proved to be a powerful restorative to their natures, and in fact, a grand panacea to the race. When they are permitted to ramble, you will see them busily cropping the green blades of the onion, with much appearent enjoyment. However, as the rainy season sets in about the time of their hatching, and their rambling habits forbid exposure to the open fields, it becomes necessary to gather and prepare it with their daily food.

Small homony made wet, with the addition of a portion of the wild onion chopped fine, or any other onion tops that can be procured, affords the best and most wholesome food they can have for several weeks at least, or so long as they are confined to small enclosures.

Last spring, I witnessed with astonishment, the wonderful efficacy of this article of food, on a large flock of turkeys, which had been daily and rapidly diminishing during the long rainy season in May. The mortality ceased the first day after their change of food to the above mixture of homony and onions; and in two or three days, their rapid growth and improvement was visible to every eye.

Turkeys are very fond of green food of any kind, particularly lettuce and cabbage, and by the time they have grown off pretty well on the onions, there is plenty of that sort of provision. Cabbage leaves, chopped and prepared in the following manner, may then be given them twice a day with good effect, morning and evening.

After the leaves are chopped, put them in tubs of water to remain all night, and early in the morning, spread the meal on boards before them: in the same way, prepare that for the evening, by times in the morning. Continue also to feed them on homony, so long as they may require your care, and I can venture to say, that the good housewife, without uncommon accidents, will have no reason to complain of the want of a good dish, whilst turkey is in season.

With my best wishes for the prosperity of your valuable exertions in behalf of the general welfare

I remain, yours respectfully,

HUSSINA.

QUERIES.

To the Editor of the Farmers' Register.

The following queries are respectfully submitted in the hope that you or some of your experienced correspondents will answer them.

1st What is the best mode and time of planting cotton;—the best distance to give it each way;—the best kind of soil, and most approved method of cultivation, in the cotton growing part of Virginia?

2nd Will the stems and branches, ploughed under in time to rot before the succeeding crop is planted, suffice to keep the land up without manure: if not, what kind of manure is best?

3rd. Has any person who may read this, ever made trial of the *everlasting pea* for hay;—if he has, what was his success, and how did he plant or sow the peas?

N. B.—This question is asked by one who once witnessed what he thought a striking proof of this pea's excellence for such a purpose; but he was a boy at the time, and did not pay sufficient attention to all the particulars of the case, to be of any service to him at present. He knows, however, enough to assure him, that the plant is perennial; that its growth is early and immense on high land of good quality; and that it makes excellent hay.

4th. Which is the earliest and most productive of the several varieties of early cimblings—the globular white or yellow—the semi-spherical white or yellow—or the flattish white or yellow; and what is the best soil and distance for them?

5th. Is it best to cultivate salisfy and mangel wurtzel in ridges, or on a flat surface, and what is the best distance for each?

Any person having the necessary experience, who will answer the foregoing inquiries, will oblige many more probably, than the present

QUERIST.

TO SAVE THE SHOULDERS OF HORSES FROM BEING CHAFED BY THE COLLAR.

To the Editor of the Farmers' Register.

Waynesborough, Va. Oct 4th, 1833.

Some of the gentlemen of South Carolina are in the habit of making long journeys by land in their own conveyances, and are obliged to resort to every method of affording relief to their horses. From one of these I derived the following simple expedient for preventing the shoulders of harness horses from being chafed by the collar. The shrewd practical sense of the gentleman referred to, is a strong guarantee of the value of his suggestions. A short trial of my own has fully convinced me of the utility of what is *classically* denominated the sweater. This simple and effectual contrivance is made of two pieces of leather, which, for an ordinary horse may be about 5½ inches wide at top, 9 at bottom, and 6 at the greatest protuberance; the front edge being straight, the posterior curved with a gradual swell adapted to the shape of the collar behind. These pieces must be sewed together at bottom, and connected at top by two small straps and buckles, so as to be let out or taken up at will. The lower part must be so shaped as to fit the throat of the horse. A strap passes from the bottom of the sweater between the legs to the girth, by means of which it is kept in place. The strap should not be too tight, lest it might incline a balking horse to stop, when ascending a hill; and the buckle at the end near the girth, if it chafe, may be covered. The leather should be tolerably stout upper, rendered pliant by the occasional application of tallow to the outside. The inner side should be kept clean and smooth.

The sweater is in fact a sheath for the shoulders, and the collar rests on it instead of the skin of the animal.

H.

EXTRACTS FROM PRIVATE CORRESPONDENCE.

King George, Aug. 20th, 1833.

My farm abounds in shell marl, but not one bushel has yet benefited the land. I have within a few days, for the first time, commenced hauling it on my next year's corn field, to be applied with the manure from the next winter's farm yard.

I pursue the three-shift system, with a standing pasture, and make all the manure I can. Should my marl prove effectual, it will more than double my resources in this respect, and consequently my speed in the march of improvement.

The Northern Neck, at this place does not exceed seven miles in width. Shell marl is found on both rivers, and I have lately discovered a bed of it at the head of one of the branches leading into the Potomac, and within a few hundred yards of the dividing ridge.

I think we are awakened in this section of the state to the subject of agricultural improvement; and I know nothing that will operate more as a stimulant, that such a production as the Farmers' Register.

[The foregoing extract marks the time of the tardy commencement of the use of calcareous manures in a part of Virginia most bountifully supplied by nature with the means. We trust that the experience of a few years will produce a greatly increased estimate of the value of this manure, as well as of the value of the lands to which it can be conveniently applied.]

——, *Alabama, August* 24.

* * * But my letter is extending much too far. I will promote the circulation of the Farmers' Register all I can; but I have not much hope of seeing improvement in the agriculture of this state, Our planters are guilty of the same profligate system of destroying lands that has characterized their progenitors of Georgia, the Carolinas, and Virginia, immemorially. They wage unmitigated war both against the forest and the soil—carrying destruction before them, and leaving poverty behind: and they adhere to old modes of culture with as much pertinacity, and about as much sense, as characterized the New York Dutchman whom the Yankee met going to mill with his wheat in one end of his bag, and a stone in the other, "to balance well;" and who, when the Yankee told him to leave the *stone* out and divide his wheat, replied, "mine fadder did so before me, and he knows better as I." They cultivate cotton and corn, *Irish potatoes and long "collards,"* just as they did, so long ago as my recollection extends. They burn all their cotton and corn stalks; they let all their stable manure accumulate 'till it becomes a mire in their stables, and huts, and gives the horses the scratches—and then they move these huts, or take some measures to throw in a gully, so that it may wash off by the first rains, and *prevent fleas from being troublesome.* There are some more provident and economical, who build their stables and huts on hill-sides—so that every rain may sweep their yards, and save the trouble above described. I mention one more characteristic fact: they are seen to save seed from the *longest stalk'd colewort*, which I pursume is for the purpose of having the leaves as much elevated as posible, to avoid the worms.

Baltimore, Sept. 1, 1833.

* * * * The most severe drought, ever known here, has existed for four or five weeks, to the utter destruction of the late potato and turnip crops, and to the extreme injury of the corn, and possibly to the essential injury of the next year's wheat crops, as it is yet impossible to prepare the ground for sowing. The earth is perfectly dry in my garden, 12 inches deep, and the leaves of cherry and other trees are falling rapidly for want of moisture.

Norfolk Sept. 21st, 1833.

Although I have no practical concern with agriculture, and *you* have some reason to know, that *theoretically*, I am entirely deficient, yet I have read, with great pleasure, the Farmers' Register, and take a deep interest in its success. Such a work has long been a great desideratum in Virginia; and I think it fortunate that is has been introduced under your auspices. Scientific research directing and regulating practical experiment—and practical experience tempering and restraining theoretical conclusions—will ultimately furnish a mass of information, which cannot fail to be greatly beneficial to our state. I have no doubt that there already exists in various parts of Virginia much valuable information on subjects embraced by your work, which if generally known, would be extensively useful. If your work answered no other purpose than to furnish the means of concentrating and afterwards diffusing the information, it would give you great claims on the respect of your fellow citizens. But it cannot fail to stimulate the public more to investigation and experiments, the benefits of which on one can foresee or appreciate.

It affords me great pleasure to perceive, as the Register progresses, that it is appreciated as it should be, and that you are receiving communications for all quarters.

GAMA GRASS.

Sept. 21, 1833.

I have read, in the coarse of the last 12 months, so many marvellous accounts of the Gama Grass, that I am strongly tempted to try some of it, if I could possibly procure any, although I am well aware, that in regard to all such novelties, it is right to ascribe at least three-fourths of what you hear to mistake, or to sheer exaggeration. Applying this discount to the asserted product of the Gama Grass, there will still be left a greater crop than any other grass has ever been known to yield, and therefore I have determined so far to subdue my skepticism as to make an experiment, if you can help me to some of the seed, or put me in the way to procure some. * * *

Fairfax, Sept. 22d. 1833.

* * * The note you appended to my last communication will be best answered by my sending you a coulter plough to Richmond. In our burning climate it has no equal for stirring the earth preparatory to fallow, *(summer fallow)* or the cultivation of corn, or any crop requiring deep fine tilth.

Upon the subject of enclosures, I have no fears: the people of Virginia, like those they sprang from, are singularly tenacious of "usages sanctified by time;" but it should be known that the common law, that rule brought over by our fathers from England, that proud "perfection of reason," laid the mantle of the law as well upon *land* as on cows, horses, or clothes. In Maryland they never gave it up; and an acre of land there, is as completely under the protection of the law, as a race horse, or a negro, in Virginia. And why not? Is it property? Surely the people believe it. Why then legislate us into one great common, and yet boast that we are a people governed by law? If this fact goes out to the world, they will hardly believe us willing to be civilized. Although my interest in human affairs is drawing to a close, I can never lay down my pen until I see every description of property under the protection of the law, without degrading discriminations. * * *

MEADES' DURHAM CATTLE.

Nottoway, Sept. 23.

As there is now a laudable spirit in Virginia for the improvement of stock, I should like to inquire through your paper what is the genealogy of that race of cattle owned by the late R. K. Meade of Fredrick county. It is said that he obtained them of Col. Powell of Philadelphia. Since Mr. Meade's death, there has been a sale of his stock, at which Mr. Warwick of Richmond obtained some. Mr. Tate of Augusta now advertises some of the proceeds of that stock. The Rev. J. Kirkpatrick of Cumberland has some of that race, and I am myself breeding from one of the direct decendants of Mr. Meade's Durham stock. I therefore feel personally, and suppose the public may also feel some interest in knowing, what portion of genuine Durham blood this stock may contain. You will therefore be good enough to insert a short inquiry in your next, with the request that some gentleman who is in possession of the information will give it. The Rev. —— Meade, brother to the late and lamented R. K. Meade, can probably, and if so, will I hope, give the information sought. As I am also in possession of some of Mr. Meade's Frederick sheep, and Bedford hogs, I shall be thankful if some of your readers would tell us something about the history of those respective races of animals.

DISTANT TRANSPORTATION OF MARL AND LIME.

Richmond, Oct. 15*th*, 1833.

* * * It would be a gratification to me individually, as well as a public benefit, if you would give your views of the utility or practicability of using marl or lime in such parts of our middle country as will admit of its transportation from below. No person can be more thoroughly persuaded than I am of the benefits to be derived from them. I have no doubt that the improvements they will effect in the husbandry of the lower country will be great and permanent. The active part you have taken in pointing out their advantages and the mode of applying them, I am persuaded, have mainly contributed to their use, which seems in a fair way becoming general. I trust you will continue your efforts in your Register, the plan and conduct of which I highly approve.

It is hardly necessary to add any particular queries—they will naturally suggest themselves to you. I have hardly a hope that any body of limestone or of marl sufficiently rich for beneficial use, is likely to be found soon in our middle country; and apprehend we must look for such applies only as can be afforded, to more favored districts from the lower country, or from the narrow vein of limestone that runs trough the state below the mountains. * * * *

[The inquiries which have been at different times addressed to us respecting the cost of marl obtained by water carriage, together with the recent (spirited but badly conducted) adventures of this kind made by several farmers on James and Appomattox rivers, have already induecd us to collect materials for an estimate of expense, which will be presented in the Farmers' Register, as soon as some additional and necessary facts are ascertained. As this estimate will be applied more particularly to marl, we will be glad to be aided by others whose experience can enable them to state the whole expense of purchasing, landing, burning, and spreading shells, as practised on the lands of lower James river—and the cost of applying the stone lime of our upper country.]

NEW KIND OF COTTON.

Sussex, 15th Oct. 1833.

Enclosed you will receive six cottan seed. Last May I planted two of the kind in a garden spot, which produced two fine flourishing stalks of cotton. I have gathered a part of the cotton off of them, and find the results to be, that the cotton weighs exactly half the seed, that is, two for one. You need not be surprised at the looks of the seed, all of them are as white, and apparently trifling.

Prince Edward.

* * * I am delighted at the growing popularity of the Register. The iucrease in the quantity of original matter, will, I think, add much to its interest with the public. It enables one to stay at home, and yet get acquainted both with the characters and the farms of some of the first men in the state. I was sorry to see a complaint of its form by a correspondent of Essex. As long as it is so interesting as to lead me to read it through the first night afier its reception, I shall neither wish to see it in weekly numbers nor in coarser print. The pamphlet form adds much to the facility of referring to articles in back numbers, and it surely will better guard the permanency of the work, as it makes it so easy to preserve the numbers for binding. If the Essex writer be the venerable gentleman I suspect, I know he will be willing "to wipe" his spectacles "and try again."

QUERIES ON RAIL ROADS.

What would have been the saving to the Petersburg Cotton Manufactory, if the rail road, now extending to the Rroanoke, had reached the Pee Dee? Would not it have saved 1 cent a lb, or $3 a bale on cotton?

May not the same be said of every Company in the Middle and Eastern States?

SIMPLE METHOD OF DESTROYING THE HESSIAN FLY.

From the Canadian Courant.

As the what crop, this season, has, in some places, suffered considerable damage from the destructive effects of this insect we are happy to be enabled, by a valuable and obliging correspondent, to publish the following directions for destroying it:

The Hessian fly deposits its eggs on the wheat ear before it is reaped; the egg is so small as to be invisible to the naked eye, but may be very distinctly seen with a microscope; sometimes one grain of wheat will be observed to have several of these eggs on it. They are attached to the wheat by a glutinous substance deposited around them by the parent fly, by which they are held so firmly on the surface, as not to be easily removed by the motion of reaping, thrashing, &c. Shortly after the seeds begin to germinate in the soil, the genial heat of the season brings the young fly from its eggs in the form of a small maggot (as is the case with all insects,) these little maggots deposit themselves at the root of the stalk, to the seed of which the eggs has been attached, between the stem and the lowest blade or leaf, where they may be discovered during the month of May and beginning of June, quietly reposing; here they remain until the warmth of the season brings them to maturity, when they commence eating the substance to which they have been attached. It is not until this period that those destructive effects are visible, by the wheat becoming withered and blighted. This accounts for the fact, that wheat which is attacked by this insect presents a healthy appearance in the month of June, the month in which the embryo fly begins to use food.

Now it is evident that if the eggs of this fly can be destroyed on the seed wheat, by any process that will not also destroy the vegetative quality of the grain, the ruinous effects will be avoided. This can be done by the following very simple process:

"Soak the seed wheat in water for twelve hours; spread it out on the barn floor, so as to allow the superabundant water to escape; then take fresh slack lime, and mix it among the wheat in quantity sufficient to have every grain covered with the lime, taking care to stir the wheat well with the shovel, so that no particle may escape coming in full contact with the lime, which, when thus applied, will in a short time destroy the eggs, and consequently preserve the grain from destruction."

Our correspondent assures us that the egg, which before the application of the lime appears clear and transparent, afterwards becomes opaque, and puts on the appearance of an addled egg. The efficacy of the above remedy has been established by several experiments, one of which we will here relate. Wheat supposed to be infested by the Hessian fly, was taken, and one half of the quantity treated with lime, and the other half was sown in the same soil with the prepared, in alternate drills; the result was, that every stalk from the prepared seed came to maturity and was productive, whilst the alternate drills which had been sown with unprepared seed, were almost totally destroyed.

The above remedy for so serious an evil cannot be too widely circulated. We would recommend its translation into the French papers, and we would thank the *Cures* of the country parishioners, to have it made known at their respective church doors after divine service.

[It is not because we have any confidence in the means of guarding against the Hessian fly recommended in the foregoing and the following articles, that we have selected them for publication—but because we know that many among our readers entertain similar opinions as to the origin of this destructive insect, and we wish to invite the expression of every opinion sustained by well attested facts on a subject so important. The "wheat insect," as it is called in the following letter, seems to be a new destroyer of this crop, and though now only known in the northern states, may, like the Hessian fly, overspread the south.—Ed. F. R.]

WHEAT INSECT—AND HESSIAN FLY.

From the Northern Farmer.

Claremont, Sept. 7, 1833.

Messrs. Editors—Having suffered considerably for two years past, from the ravages of this insect, half of my crops, at least, having been destroyed by them, I formed a resolution, that if it should be possible, I would gain some more information concerning them, than I had yet possessed. Accordingly, this season, I prepared a piece of ground near my dwelling house, and sowed it with wheat, that I might more conveniently make, at all times and seasons, the minute observations necessary to my design. I examined and watched, by *day light*, for the fly, which deposited the eggs of the wheat insect on the ears; but in vain. I could discover the eggs, but nothing of the insect which deposited them. I concluded it must be a work of darkness; I therefore commenced a course of observations by candle light. I now soon discovered the parent fly, the cause of all this mischief to the wheat crop; and had an opportunity to observe its habits, and study its instincts.

Soon after dark, the flies cummenced, in great numbers, crawling slowly up the stalk, from the ground, and ascendod to the top of the ear, where they commenced depositing their eggs; where a single fly, in many instances, deposited sixty eggs at a time. At the approach of morning, the flies were again in motion, and descended slowly to the ground, and disappeared. These flies are about the bigness of the common house fly, but somewhat longer, and more slender, and of a green color. The ears of wheat, at this time, were only partially out of the sheath.

Another important fact, which may throw some further light on the habits of these insects, is, that their ravages are most destructive on the borders of the field. Though, in relation to small fields of wheat, this may not be true, yet, from my own observation, as well as from information derived from others, I am satisfied it is the fact in relation to larger fields, so far, at least, as respects the present season. This being the fact, it goes far to show, that the embryo from which the fly is produced, in the spring season, is preserved in the earth through the winter, and, not like the eggs of the Hessian fly, attached to the grains of wheat; that the worms remain in the soil of the wheat fields of the last year through the winter, and as soon as hatch-

ed, the flies proceed to search for the fields of wheat as the place for depositing their eggs; and unless the field be small, or the flies exceedingly numerous, the confine their operations, in a measure, to the borders of the field.* I am satisfied that the eggs of this insect are not deposited on the grains of wheat, otherwise. the manner of preparing my seed for sowing must have destroyed them. I have, toprevent the ravages of the Hessian fly, for the last thirteen years, prepared my seed wheat, by washing it thoroughly, and while in a wet state, pouring over it boiling hot ley, of wood ashes, sufficient to cover it, (no matter how strong the ley is) and drawing it off immediately. The ley will co lor the wheat, but will not injure the ge.m, or prevent it from growing. By this process, the eggs of the Hessian fly are destroyed, which are attached to the wheat: and by long experience, I am satisfied it affords a complete remedy against the ravages of that insect. I have often sowed wheat prepared in this way in the same field, by the side of the same kind of wheat, without any preparation. The former has uniformly escaped the ravages of that insect, while the latter has been materially injured, and in some cases entirely destroyed. I therefore consider the Hessian fly a much less formidable invader of the wheat crop, than I have formerly; but I have yet found no remedy against the ravages of the insect in question. It has been said, that the sowing of new slaked lime over the wheat, when the dew is on, during the time the fly is depositing its eggs, will put a stop to its operations. But how this may be, I cannot say, not having tried it myself.

N. B. In preparing the wheat for sowing, as mentioned above, my practice is, to prepare but one bushel at a time, lest, by remaining too long in the ley, the germ should be destroyed. As soon as the ley is drawn off, I mix with the wheat as much plaster, lime or ashes, as, when stirred well into it, will prevent the grains of wheat from adhering together, and sow it immediately.†

DAVID HURD.

MANGEL WURTZEL.

From Goodsell's Genesee Farmer.

This is the German appellation for the field beet, more commonly written mangold wurtzel or mangel wurtzel, and sometimes, though erroneously, called scarcity beet. It is believed to be a mongrel between the red and white beet, has a much larger root than either, and grows principally above ground.

Uses.—This succulent food is admirably adapted to the feeding of cattle, sheep, swine, &c. Neat cattle prefer mangel wurtzel to any other root that can be offered them; and its effects in producing large secretions of rich milk of fine flavor, are abundantly attested by American writers. Not only is the milk increased, but the quantity and quality of the cream, and consequently the product of butter. But milch cows, fed on mangel wurtzel, ought to have occasional changes of other food, as they are apt to become too fat for good milking. In the latter part of the season, many farmers are in the habit of pulling off the leaves, for feeding cows, sheep, &c. We would caution such against this practice, until after the middle of October. It is a generally acknowledged fact, in vegetable physiology, that the leaves are the principal agents in the elaboration of the farina of vegetables, and whatever diminishes the power of developing the nutritive properties of this or any other plant, diminishes in the same ratio, its value in domestic economy.

Mangel wurtzel answers remarkably well for sheep during the lambing season, which usually happens when grass is not to be obtained; keeping them in a thriving condition, and affording a free flow of milk. Stall sheep fatten well on this alone, though it is better to allow them some hay, say at the rate of twenty-five pounds of mangel wurtzel and five pounds of good hay per day to each sheep. In five or six weeks they will be ready for market; the probable gain will be from four to five pounds per week, in good sheep.

Swine fattened on this root, yield firm pork, of fine flavor; it is fed raw, and much superior to corn or potatoes, in point of economy.

Soil.—A clayey loam is the best, but any soil will suit, provided it is well pulverized and rich. Large crops have been raised on strong clay, but as this is apt to bake, it prevents the expansion of the roots—and should not therefore, be chosen, when a soil that is not liable to this inconvenience can be obtained. As a general rule, good corn ground will grow mangel wurtzel.

Mode of culture.—Whatever be the soil, give it a good broad-cast manuring in the fall, if practicable, and plough it in. In the spring, harrow it well, and throw it up in ridges three feet apart. By this manuring, more nutritive matter is afforded to the lateral fibres, which this root sends out in pursuit of food. On these ridges, draw a light furrow or drill, about two inches deep, and sow the seed from one to two inches apart in the drill. Sow plenty of seed—the young plants are easily thinned out in hoeing; but if deficient, are not so easily replenished, and the expense of a few more seeds is nothing, compared to the insurance of a good crop. From three to four pounds is considered by Mr. Garbutt as the proper quantity for an acre. The after-culture is easy, and consists principally in weeding, which may be performed with the hoe and plough, when necessary. The plants, when well started, must be thinned out to ten or twelve inches—this part of the business is most expeditiously performed with the hoe, when weeding, and wherever the crop fails in part, from any cause, the intervals may be advantageously filled up with ruta baga, which is in season for sowing, as late as the 25th of July.

Some prefer making trenches three feet distant, in the spring, by passing the plough up and down in the same furrow, filling the manure in this trench, and covering it by passing the plough up and down the outsides, thus making a ridge with the manure under it, and sowing on the ridges, as above. Experience proves this method objectionable. If the season is dry, this trench of compact manure renders the ground above it, still drier; and, as the manure lies in a body, though the tap

*An intelligent farmer in this town informed us, that his field of wheat, of six or seven acres in extent, was attacked by this insect on one of its borders only, and that, next to a piece of ground where wheat grew the last year, and which had been ravaged by the same insect.—[*Ed Nor. Far.*

†This mode of preparing the seed has also been found to be an effectual remedy against smut.—[*Editor Nor. Farm.*

root may reach it, yet the lateral fibres will receive no benefit from it whatever. But, by being thoroughly incorporated with the earth, by the fall ploughing and spring harrowing and ridging, the whole crop receives the full benefit of whatever nutrition it may contain. Others, again, contend that the ground ought to be made perfectly level and smooth before the seed is sown, as a safeguard against dry weather; but so far as my knowledge extends, crops, treated in this way, have not been so abundant as parallel crops on ridges, and they certainly require more than double the attendance. For, in hoeing, many of the young plants will be covered, and the operator must stop and carefully brush away the earth with his fingers. But, planted in ridges, all the earth and weeds loosened by the hoe, fall away from the plants into the furrows. These various methods of culture, with slight variations, have their advocates; but I believe the course recommended in the forepart of this paragraph, will be found the most economical and profitable.

Time of Sowing.—The proper time for sowing mangel wurtzel, is the last week in April, or first in May. Though it is commonly sown later, experience proves that early sowing insures a better yield; the vegetation is less precarious, and the roots larger and more fully matured. Yet the time may be varied a little, either way, regard being had to the forwardness or lateness of the season. The seed does not sprout well if sown in a dry time; the husk being hard and firm, requires considerable moisture to cause the seed to start; but in long continued and heavy rains, it frequently rots in the ground. The seed requires no previous preparation.

Product.—The quantity produced on an acre varies from twenty-five to fifty tons. A fair average crop may, with safety, be set down at thirty-five tons, and the expense of culture at from twenty-five to thirty dollars, including manure; ploughing, weeding, gathering, seed, &c. In England, it is said, that upwards of sixty tons have been raised on an acre.

Comparative Qualities.—Various comparative experiments have been instituted by American farmers, which have almost universally resulted in favor of mangel wurtzel, both for keeping and fattening stock, over ruta baga, carrots, and all other succulent food. It is not liable to the attack of insects; whereas, turnips, cabbages and other vegetables, are frequently entirely cut off; neither does it suffer much from the variety of seasons. It thrives in almost any soil, and will keep sound and firm eight or ten months. The flavor of milk and butter of cows fed on this plant is improved; but it is impaired when turnips are given. As a further proof of its nutritive effects, we would observe that Bonaparte passed a law that the whole farming community of Flanders should set apart a portion of their farms, for the cultivation of mangel wurtzel, to be employed in making sugar. The experiment proved, that good sugar could be produced, at one shilling per pound, when, at the same time West India sugar was selling at five shillings in France.*

For fattening swine, five bushels is believed to equal one of corn. Compared with hay, there are various estimates, varying from two to three tons, to one of hay. But whenever mangel wurtzel is given to stock of any kind, they ought to have an allowance of their accustomed food, either with it, or during the intervals of feeding.

Objections.—There are some authorities who speak unfavorably of the use of mangel wurtzel, as food for milch cows. Henry Colman, of Salem, says that his cows, when fed from half a bushel to a bushel per day, were much reduced in flesh, though the quantity of milk was increased, and its quality improved. It is asserted in the British Farmers' Magazine, that the roots ought not to be used before Christmas, and the cattle ought to be habituated to them by degrees—that it purges cattle and reduces them to a very thin state. Mr. Cook's cows were materially injured by the free use of mangel wurtzel, and some of them died. In the same Journal, the Rev. Henry Berry remarks, that he fed mangel wurtzel liberally to his cows; but he soon found them reduced to skeletons—the quantity of milk was increased, but it was both thin and poor. The bad effects charged to this root are principally of foreign origin. In western New-York, we have not heard any bad effects attributed to its use; and we make these quotations to put growers on the alert, that they may canvass the effects of this justly esteemed and invaluable food. If it is liable to these objections, let us look round for the preventive means.

The mode of preserving is precisely the same as for potatoes. They must always be put away dry—this is essential to their preservation. The covering ought to be sufficient to keep out the frost, but not very warm, as they are finest in the spring when kept rather cool. To contain those to be fed in the winter, a double pen or bin might be made in the barn-yard, or any convenient place, of boards or rails and post, the one within the other, and the interval filled with long manure. The roots put into this will keep well, if it is properly constructed and thatched with straw, and be of easy access though a convenient opening. It will be recollected that the leaves are to be pulled off immediately after the roots are taken out of the ground. They may be fed to cattle or sheep, and will be found quite an adjunct to the pasture fields.

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The following extract of a letter, from William Gurbutt, Esq. President of the Monroe County Agricultural Society, to the editor, will we trust, be read with satisfaction. Mr. Garbutt is a practical farmer, and has had more experience in the cultivation of mangel wurtzel, than any other farmer in this neighborhood, which renders his observations more interesting.

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* That the compulsion of law should be required to aid the enormous encouragement created by Bonaparte's prohibitory, or continental system, which raised the price of West India sugar to five shillings the pound, is but a bad proof of the profit of making beet sugar. A better proof however, may be adduced, from the fact that the extension of this branch of industry is still recommended as profitable, in Belgium, though the former scarcity and high price of sugar no longer continues. See "*Observations sur les avantages qu'il y aurait, à multiplier les fabriques de sucre de betteraves,*" published in 1830, in the *Journal d'Agriculture, etc. des Pays-Bas.*

ED. FAR. REG.

Wheatland, July, 1833.

Your remarks on the field beet are good, but I do not know how to account for the scouring and loss of flesh mentioned by the English authors. unless the ground had been very soft, so that much earth adhered to them when pulled. I conceive that cattle fed on them alone, when in such a situation, might be subject to such complaints, but I never had any thing of the kind happen to any of my stock.

I always commenced feeding my milch cows with mangel wurtzel as soon as the pastures begin to fail in autumn, which sometimes happens as soon as the middle of October.

I commenced giving from half to three-fourths of a bushel to each milch cow; and twice that quantity, to one when fattening, is sufficient. To feed an animal entirely on field beets would be like a person's living upon butter; and therefore, feeding at the same time, some coarse fodder, is not only good economy, but absolutely necessary. The value of mangel wurtzel to those engaged in raising stock, is very great; chaff and straw, when fed to stock with beets, are preferable to the best hay, when fed alone; and by such feed the cost of keeping stock is much reduced.

WILLIAM GARBUTT.

THE RAIL ROAD FROM RALEIGH TO NEWBERN AND VIA WAYNESBOROUGH TO WILMINGTON.

From the North Carolina Journal.

Sirs:—As it is now more than thirteen years since there was published in the Cape Fear Recorder, the diagram of a set of rail roads, so constructed, if I recollect aright, as to intersect the whole of the lower part of the state of North Carolina, and over part of the same ground which I learn, from the Raleigh Star, is now proposed to be covered, it was with infinite pleasure I learned, that "the delegates from the counties more immediately interested in the work, had held a meeting, at which it was determined, that proper measures should be immediately adopted, to connect Raleigh with Newbern and Wilmington, by a rail road. The work is to begin at Raleigh and branch off at some convenient point, (supposed to be Waynesborough,) to Wilmington." I believe a reference to the file of the Recorder will show a partial coincidence between the projector of the diagram and the one now proposed. The only copy obtained by him, was lost. It was confided to some privileged prig in office and politely detained by him, without the slightest notice of either project or projector.

"The counties more immediately interested," I take to be, Wake, Johnson, Wayne, Edgecombe, Green, Lenoir, Jones, Craven, Carteret, Onslow, New Hanover, Duplin, Sampson, Bladen and Brunswick; but as I do not understand divisions in states any more than I believe a house divided against itself can stand, I would add Cumberland, Robeson, Mecklenburg, Cabarrus, Montgomery, Anson, Richmond, Moore and Chatham. On a loose calculation, the first named will give us a population of 80,000 whites and 50,000 blacks; the latter 73,000 whites and (only) 26,000 blacks; making a total of 153,000 whites, and 76,000 blacks—together, 232,000.

The necessity of obtaining the physical and the fiscal aid of the latter counties, is self evident from their numbers, their nature, and their consuming as well as their productive powers. Besides this, it is evident that, if the road be run up either bank of the Cape Fear to Fayetteville, and thence to Charlotte, it will there meet with a road which is to be laid down from Columbia, S. C. through Winnsborough, Chester, York, and ———, on the North Carolina line, within——miles of Charlotte. If it be not done, Columbia will carry off an immense amount of traffic from Mecklenburg, &c. &c.; and if it be done, there are many periods of the year, when produce can be conveyed, *possibly* from Columbia, but *certainly* from Chester, York, &c. &c. &c. to Wilmington instead of to Charleston. As to Waynesborough, no objection can be made; a branch of the rail road may still pass it; and, as distance is, comparatively speaking, no object, no inconvenience will be felt. And the banks of the Cape Fear must offer an admirable site for a rail road. This will be more than equivalent for a little distance.

It is *difficult* to imagine the *animus* of a measure, similar to that proposed at Raleigh; *impossible* to account for the exclusion of Fayetteville; and *impracticable* to give a reason for the substitution of Waynesborough. It would seem that Newbern was the leading object—Newbern, with about one quarter the tonnage owned by Wilmington, was thought more of than that ancient city.

These gentlemen surely forgot, that with the attraction of the two rail roads, and the bridge at Weldon, and without the trade of Fayetteville and its commercial dependencies, their rail road will rather prove a way for the produce to go to Norfolk, than open a passage for it to Newbern and Wilmington—for nothing can prevent the extension of the road from the Roanoke to Raleigh, and that once completed, the produce of the important country of Salisbury will find its way to the metropolis and thence to the Roanoke.

The sentiments and statements of Mr. Bryan, published some years since, speak volumes on this subject.

Nothing can save Wilmington as a port, but the united efforts of the whole southern flank of North Carolina. Let what will happen, Fayetteville must increase in importance. Hence, the application of such an exclusive spirit to her, is to say the least of it very weak.

Let us now speak of the *modus operandi*. Let us carefully, very carefully, recollect the observation of Dr. Howard, on the subject of the Charleston rail road, at its commencement. This civil engineer, in the employment of the United States, then said, that "to establish a communication between the two places in *straight* lines, formerly thought (first by Pope Sextus and next by his successor at Castle Hill,) to be of such *primary* importance, is now deemed a consideration the *last* to be consulted. He allowed $800 per mile for graduating the route he surveyed. This for 150 miles, was $120,000. Mr. Blanding's statement was $93,000; Mr. Mills estimated the graduating at $200 per mile, or $30,000. The general totals were., Mr. Howard $637,000; Mr. Blanding $611,000; Mr. Mills $370 000.

At present the public have no means of ascertaining what would have been the cost of graduation; possibly an average of the three estimates. The real fact is only to be determined by those who possess the drafts of the working sections, *if*

such were used. However, we know that the charge for constructing, *etcetera*, has been $800,080, or for 135 miles $5,175 for a single mile. Thus, the iron is about $705, the construction and *part* of the *etcetera* about $4,470. There are other *etcetera*, which the report says will amount to $200,000; probably it will reach $300,000; although when *one third* of the contract labors had been *completed*, the engineer thought $600,000 would cover the *entire* construction, &c. &c. The freight of one blade of cotton is TO BE *one dollar and fifty cents* from Augusta to Charleston.

However, I am forgetting my subject, which was the *modus operandi*. The early and anxious object of attention should be the site of the road; and the *dictum* of Mr. Howard as to distance, should, I repeat it, be well and carefully recollected. The site once determined, the object should be to clear it of timber, reserving such as may be of use in the construction of the road, and letting this all be done, as far at least as is possible, by the *slave labor of the country*. This finished, let levels be taken of each mile, or when in level districts offering little deviation from a flat, of as many miles as will form one contract. Then, the draftsman, having exhibited the elevations and depressions on paper, will be able to ascertain what number of cubic feet of dirt is to be removed; and, with this working section in his hand and the ground staked out, the ordinary overseers and drivers of the country, as well as every other intelligent man, can effect the work either by his own or his negroes' labor, as well as it can possibly be done by the engineers and laborers of New or Old England, or of Old Ireland.

This was the annual charge of Engineers &c. on the Charleston road:—

Chief Engineer, (for 8 months,)	$4,600
Commissioner,	3,000
1 Resident Engineer,	2,500
2 do. do.	4,000
Road attention, &c. &c.	1,240
	$14,340

In short, surveying, superintending, and engineering, have cost the company $52,607!!! And I verily believe, although they only estimate their eventual expenses at $157,000, they will amount to $200,000. They cannot expect to carry more than 150,000 bales and at 50 or 60 cents per bale: this will be the maximum.

The next consideration would be the superficial work. I should think, that as the road will be little short of 300 miles, the cheapest and best way would be to commence a preliminary road, till the road is well settled and the materials brought, at a cheap rate, for its final completion, and then lay down two or four sills, well and firmly connected, and to each of them, attached on the upper side, a lath of the hardest wood, about 2½ inches wide and 1¾ or 2 inches thick. Then an iron wheel cast to fit this lath would, as soon as the centre was filled up, be used by the wagons and horses, as they were formerly in Wales, be substituted for the expensive steam car which is to cost the Charleston company $108,000, and $54,000 for the wear and tear. They do but calculate on $27,000.

If the Charleston Rail-road Company would furnish us with the particulars of its *etcetera*, and let us know what it *would have cost* to have graduated Mr. Howard's 150 miles, and *what it did cost* to *frame* Mr. Black's 135, so liable to decay as well as to destruction by fire, much light might be thrown on the subject. However, I do not expect *lux e tenebris*. I shall take the liberty to conclude by averring, that in my humble opinion, fully $1,000 if not $1,500 per mile, *more than was necessary*, has been expended; and more, infinitely more, than would have been necessarily disbursed, if a cheap preliminary rail-road had been laid down. Such is understood to have been the case in the Camden and Amboy road, between Philadelphia and New York.

I look with great impatience for the address of the committee: we shall behold the efforts of a master mind, in the production of the patriotic and polished Gaston.

A word at parting, as to the number of laborers. Of the 232,000 persons, the labor of one twentieth, or 11,600, might be applied. But we will calculate only on 5,000 being obtained; of these, we will suppose there are 4,000 negroes and 1,000 whites; there are 300 miles or 600,000 yards to be completed; if each man would perform 2 yards *per diem*, after the ground was cleared, it would be 10,000 yards *per diem*. Hence, 60 days would complete the labor. The labor of each day would cost $2,500, thus producing a total of $150,000. However, for *etcetra*, we will quadruple or quintuple it, and we shall have 300 miles of road for the same sum as the sage Charlestonians have to pay for 135 miles.

Labor is calculated at 50 cents per day, under an idea that the citizens of North Carolina will take contracts and receive pay for their completion in rail-road stock, which will be good at the banks. If any be left not so taken, contracts may be made for a lesser sum *per diem*.

TELFORD.

Carthage, August, 1833.

CORN INJURED BY CUTTING THE TOPS.

From the New England Farmer.

I noticed a statement in the New England Farmer, by which it appeared that the early topping or cutting corn stalks, proved, upon fair experiment to be injurious to the ears of corn, and that the corn not topped at all was heavier than that which was topped. All the farmers in New Hampshire, I believe, are in the habit of cutting the stalks while the corn is in the milk, or before the inner part of the kernal is hard. A little reflection convinced me that this practice is wrong. I this year raised between two and three hundred bushels, and suffered no part of the corn to be topped. After the corn was fully ripe, I commenced by having the corn cut close to the ground, tied in small bundles, and put into small shocks by the side of the corn field, to dry, and thence conveyed to the barn; a practice which in common seasons will be beneficial; but afterwards I found the corn so fully ripe and dry, standing in the field, that I had it cut close to the ground and conveyed in small loads to the barn, husked immediately and put into a granary made for the purpose, standing on posts, properly ventilated. The result was, that my corn was very heavy, large, perfectly sound, and "as sweet as a nut." Many ears were found from twelve to fourteen inches in length. But I plant a large kind of yellow corn; the kernel is very large. Many have expressed

an opinion that they never tasted bread, made of it, so sweet and of such fine flavor. I have never known any corn equal to it, although it is well known that we never had a season more favorable to corn. The cattle appear to relish the stalks as well as those cut green—there is no loss in this particular—but a gain, in respect to the under stalks, often left exposed in the field after the corn is gathered.

There can scarcely be a doubt but what the corn will ripen earlier and be heavier, by suffering the tops to remain until the corn is *fully ripe*. It is not fully ripe until the inner part of the kernel becomes rather hard, or is "out of milk," as farmers say. Then the corn may be topped without injury. Nature does nothing in vain. It is idle to say that the ear of corn derives no nourishment, while green, from the top stalks. Every part of the stalk, leaves and all, are necessary to the growth and maturity of the ear, and the saccharine juice gently oozes into the cob, and from the cob into the kernel until fully ripe. It would be as rational to contend, that the amputation of an arm would not injure a man, as that the cutting the green stalks would not tend to wither the green ear of corn. I am aware, Mr. Editor, that this doctrine stands opposed to the prejudices of farmers generally, yet I fully believe that fair experiments will, not many years hence, induce them to support it.

Another practice among farmers deserves censure. They often pile up their corn in large heaps in the barn in order to have what is called "huskings." In this pile there are green materials, green stalks, green ears, and foul matter, which, after laying a short time, produce fermentation, the whole heap becomes warm, and tainted with the noxious gases or effluvia that penetrate every part. The corn is afterwards husked, and often placed in rooms not well ventilated. The corn may be sound and look finely—the bread palatable and called good, very good. But the question whether it might not have been rendered *far better and sweeter* with proper management, seldom, perhaps, enters the farmer's mind.

One of your correspondents, an enlightened and practical farmer, informs me that he was fully convinced, that corn would not ripen so soon by topping it while green. This is also against the general opinion, but not, therefore, incorrect. He also stated, that he topped a portion of a cornfield, before the corn was out of the milk, in order to feed his oxen, a practice very common; and that when he gathered his corn, that portion so topped, was inferior to his other corn in the same piece, the soil being equal.

WM. CLAGGETT.

Portsmouth, N. H. Feb. 13, 1833.

A SUCCESSFUL METHOD OF RAISING DUCKS.*

From the Southern Agriculturist.

Charleston, February 1833.

Believing it to be the duty of every individual to contribute for the benefit of society, any information he may possess, however small, and on subjects ever so humble; and having for several years past been in the habit of seeking recreation during those hours which were not devoted to severer studies and labors, in a variety of experiments on subjects of natural history, I propose giving you the result of some experiments in raising ducks, which were carried on during a number of years, and which finally eventuated in complete success.

It is sometimes beneficial to examine the causes of our failures, and it affords me pleasure at this moment in retracing the steps by which, after many disappointments, I gradually accomplished the objects to which my inquiries and experiments were directed. As an account of the process by which I arrived at these successful results may not be uninteresting to those of your readers who devote themselves to rural pursuits, and who pride themselves on having a well-stocked poultry-yard, I hope it may be no tax upon their time and patience, if I go somewhat into detail.

During many years I was struck with the general want of success which attended the raising of this species of poultry. Not one-sixth of the young were ever raised—they appeared to be subject to innumerable diseases. Those that escaped were stunted in their growth, and did not arrive at full size till they were many months old. The general complaint among farmers and planters was, that this, the most valuable of our poultry, was a puny bird, hard to raise, and subject to many diseases. They could raise fowls and even turkeys, but there was no certainty with regard to the duck.

Desirous of investigating the causes of a failure in raising a bird which in its wild state is very hardy—which, although exposed to all the vicissitudes of the weather, raises large broods of young, I procured several ducks, determined to pursue my experiments in various ways till I should either be successful or be satisfied that in a state of domestication, there existed obstacles to their successful rearing which no foresight or care could prevent.

At first I adopted the usual mode of giving them access to as great a body of water as I could provide for them in the yard. I therefore had an artificial pond made near their coops, to which they could resort as often as they chose; here they amused themselves at all hours of the day, in dabbling around the edges of the pool, and in swimming and diving in the water; but they did not grow—they were subject to cramps and fits, and one after another died, until I began to think that water was not their proper element. I varied their food—gave them rice-flower, corn-grist, boiled potatoes, hominy, bran, and many kinds of vegetable food, but with the same results—and of a hundred young that were hatched, I scarcely raised a dozen. I then began to mix with their food various medicinal herbs, believing that this might correct some deleterious properties of their food, but it was to no avail. I next procured the different varieties of ducks for breed, thinking that perhaps one kind might be better suited to the climate and the confinements of the poultry-yard than another; but I was soon convinced that my want of success was not owing to my breed of ducks. Several years passed away and left me pretty much where I began, and I was almost ready to abandon any further attempts at raising the duck.

The thought at last occurred to me that in the food with which we usually fed this species of poultry, we departed widely from nature, and that, al-

* This is the article referred to and recommended by a correspondent, in No. 5. of the Farmers' Register.

though the old ducks in their wild state fed on rice and the seeds of various grasses that are found along the edges of the rivers, brooks and ponds, yet, that at the spring of the year, when the young wild ducks are hatched, there are few seeds ripe, and it is questionable whether at that early age they feed at all upon grain or seeds. There appears in the digestive organs of these young birds something unsuited to this kind of food—it passes through them without affording much nourishment. I had ascertained by dissection that their gizzards were filled not with vegetable food, but with the fragments of small craw-fish, worms and various aquatic insects, as well as the spawn of fishes, and I determined in the following year to try the effects of animal food. In due time my young ducks were hatched, beef was given them at first, after having been chopped very fine; this they devoured greedily, and eat it in preference to all kinds of vegetable food. The effects upon their health and growth was immediate and surprising! They appeared to grew faster than any other poultry—in a few weeks they were out of danger, and in a few months fit for the table. As beef was expensive, I tried cheaper kinds of food, such as the haslet of animals, crabs, fishes, &c. The result was equally favorable. I was now satisfied that in the article of food the end is attained by simply following nature, and giving the young ducks animal food.

But although my experiment was thus far favorable, I found that many of my young ducks died after having been suffered to go in the dews and water, and that after many showers of rain they became thoroughly wet, and that when showers were succeeded by hot suns, they were subject to a disease of some apoplectic character, or a *coup de soleil* which killed numbers. Here I was much puzzled. I had succeeded in one instance by following nature, but I found that I could not carry my theory through, and that water affected the domesticated duck very differently from what it did the same bird in its wild state. The fact was not unknown to me that the down of young wild ducks is almost impervious to water; they are exposed to dews and rains—they dive to the bottom of pools and streams, and live in the water; yet they always keep dry—an oleagenous substance is spread over their feathers, from which the water glides off instantaneously and leaves the bird dry during all weathers. Not so with the young of the domesticated duck. Owing, either to the confinement of numbers in a small space, where their down becomes ruffled and displaced, or to their not being able to procure that kind of food which in the wild state is favorable to the secretion of that peculiar oil which is found contained in the glands of birds, and which serves to lubricate their feathers and protect them from the wet, the down of the young tame duck soon becomes thoroughly wet, and when this is once the case, it is subject to various diseases and is difficult to raise. To accommodate the young duck to that artificial state into which it had been thrown by domestication, I found it necessary to adopt some mode by which during the first few weeks of its life, (the only time in which it requires much care,) it might be preserved from the effects of that element, which in its native state is almost its only residence, and furnishes the means of its subsistence. A little reflection enabled me to guard against the inconvenience and dangers which result from this state of domestication. I had my coops built pretty large and tightly shingled, so as to be impervious to water. The young ducks were not let out in the morning dews till the sun had dried the grass, and the vessels in which their water was placed were railed over, so that they could drink by inserting their bills between these little railings, but were prevented from getting into the water. After following these simple directions with regard to food and shelter, I found that by a little attention of a servant, I could supply my table with ducks the whole year round—that I seldom lost one in twenty, and they were free from all diseases. I raised from one hundred to three hundred ducks per year, and now found that they were the easiest of all poultry to raise. I communicated the result of my experiment to my friends. Those of them who had the disposition, the patience and industry, followed my directions, and in every instance met with the same success. I have their assurance, that they can now raise ducks in any numbers, and some of them have for the last two or three years supplied our markets with from three to five hundred ducks of the largest size and finest flavor.

After having carried my readers though this perhaps to them tedious detail of experiments which cost me much time and attention, but for which I was more than repaid by the successful result, I shall now proceed to give, under different heads, such simple directions as will enable our planters and farmers to supply their tables with this kind of poultry, which might be an object to those who are in the habit of supplying our markets.

1. *The species and varieties of ducks best adapted to the purpose of breeding.*—The only two species of ducks that are raised in this country are what are commonly called the English duck and the Muscovy duck. The English duck is a descendant of the wild duck that visits us every winter in such numbers, called the mallard (*Anas boschas*) is found also in Europe, and breeds in England, although not the largest, it is certainly among the finest flavored ducks in the world. The flavor of the famous convass-back duck (*Anas vallisneria*) that is found so numerously in the Chesapeake, and more recently in the Santee, and at the mouth of the Savannah river, is no doubt superior to it, but it is supposed that this is owing to the peculiar kind of root on which that feeds, believed to be the *Valliseneria Americana*—and that were it fed on common food its flavor would not be superior.

The English duck, which is so common in our yards, has from its long domestication, run into a number of varieties, which differ so much from each other as to appear like different species; they are of different sizes—of a variety of colors, and some are tufted. The variety to which I have usually given the preference, goes by the common name of the Madagascar duck, is distinguished by its being of the largest size—having a pretty long neck and almost invariably a light streak above the eyes, and usually a small streak extending from the lower part of the upper mandible to below the eye.

The Muscovy duck (*Anas Moschata*) is another duck more recently introduced, but which is now very common, and is well deserving a place

in our poultry-yards. It was formerly, by most writers, considered as coming from the eastern continent, but is now well ascertained to be a native of South America. This duck, in our southern climate is, perhaps, more hardy than the other—sets more steady on its eggs, and lays in the spring and fall. A mongrel breed between this species and the English duck is easily produced, and has become very common; but these, through they are good layers, are unable to propagate their species.

There are other species of ducks, which the curious in these matters have partially succeeded in domesticating. I once saw a fine flock of the Gadwall ducks, (*Anas strepera,*) which an individual, in the upper part of the state of New York, had succeeded in raising from ducks which he had captured, and which bred freely in his yard, and made no attempts at flying away. Our beautiful summer duck (*Anas sponsa*) breeds freely in some parts of France and in the Zoological Garden in England. But it is very probable that the two species mentioned are as well adapted to our purposes as any other, and that, for many years they will be the only ones which will be generally kept in our poultry-yards. One drake will answer for five or six ducks. Where mongrels are to be bred, place in a separate yard, one Muscovy drake to four English ducks.

2. *The best mode of procuring an abundance of eggs.*—When ducks are raised in the country and have access to rice fields, ditches, ponds, and the borders of rivers, they find food best suited to them and generally lay early and freely. But where they are necessarily kept in yards, and do not possess the above advantages, it will be necessary to adapt their food to their situation. A mixture of any kind of animal food with their rice flour, corn meal or grist, given them regularly and plentifully three times a day, will enable you in procure a great abundance of eggs; where this is neglected, your English ducks will lay but sparingly. I have observed that animal food is not so necessary to the Muscovy duck, but that they will lay pretty freely on being fed on grain alone.

3. *Setting and hatching the eggs.*—The English duck, although a good layer, is very careless about hatching its eggs until late in the season. I have invariably used the common hen for that purpose; and when the young ducks are removed as soon as they are dry, their foster parent will set again on other eggs; and I have thus known a single fowl to bring out three, and even four broods of young ducks in succession. In that case, she should be repaid for her faithfulness by being richly fed. The young ducklings, in this climate, leave the shell on the twenty-sixth day. The Muscovy set a few days longer. A fowl of a tolerable size will cover from thirteen to fifteen eggs. After the eggs have been four or five days under the hen, you may, in the evening, examine the eggs by the light of a candle or lamp. Place the eggs longitudinally between the fore finger and thumb. If the egg be likely to hatch, it will be of a dark color, with streaks of red frequently perceptible; and the cavity on the thick end will be somewhat enlarged and transparent. If it be a clear egg, it will be wholly transparent, and it ought to be removed at once; and if it have not been kept too long in the nest, it is still fit for use. In this way, when several hens have been set nearly at the same time, it will frequently be practicable to remove a sufficient number of clear eggs, so as to place a fresh setting of eggs, under one or more of them. The Muscovy duck sets faithfully, and may as well be permitted to hatch her own young.

4. *Method of destroying fowl lice.*—The insects which infest the setting hens may be easily destroyed by thoroughly sprinkling the nest, and wetting the fowl, even to the skin, with a strong decoction, made by pouring hot water on a handful of common leaf tobacco, mixed when cold with a table spoonful of spirits of turpentine, and double the quantity of gunpowder. It will be well, also, occosionally to take away their old nest and make a new one of fresh hay or straw.

5. *Duck coops, food, and manner of rearing the young.*—Let your coop be made pretty large; say three or four feet in length and three in depth. Let it be well shingled, so as to exclude all water, and have a good pitch towards the front. Let it be tight on three sides and barred in front, with a slide below the lower bar, so as to retain the ducks in unfavorable weather. A space of ten or twelve feet square, formed of common boards set up edgewise, will, when you have not much room in your yard, suffice for fifty ducks. Keep making coops in proportion as your ducks increase in numbers, and endeavor to keep the different sizes separated. The first brood, early in the spring, requires, for a few days, the warmth of the hen's body; and she should not be made to take care of more than twenty or thirty. A little later in the season, the young that are then hatched do not require the services of their foster mother, and may from the beginning be placed in a coop by themselves, to the number of fifty. Young Muscovy ducks may be treated in the same way; and they and the mongrels and English ducks, may all be indiscriminately reared together.

As soon as your young ducks are hatched, let them be placed together, for a few hours, in a basket containing some warm inside lining; and when they have sufficient strength, place them with the hen in the coop. Feed them with meat, or animal food of any kind, chopped fine with a chopping knife. For convenience, I have usually had it boiled. A little rice flour or corn meal may be mixed with it, and the latter may be increased, if you have but little meat. Let this be continued for three weeks, and they are out of danger and can be raised on any kind of food. Still it is to be observed that ducks in all cases thrive better on animal food, and where this can be conveniently obtained, it may as well be given them. Those planters who live near our sea coast, by running a tight board fence across any small branch of salt water, and placing in the centre a fish-trap made of laths, can easily procure a sufficient quantity of fishes and crabs to feed all their young poultry. A man with a cast-net could in half an hour do the same. I have known persons in the interior of the country, substitute squirrels, rabbits, and even venison; and one gentleman fed his young ducks on the flesh of alligators, thus rendering that which was a nuisance, subservient to his profit. When your young ducks begin to be tolerably feathered on the sides, which will be in five or six weeks, they may then be turned into the common poultry yard—always bearing in mind, that those which are best fed, and obtain most animal food, thrive the fastest.

I have not treated of diseases to which ducks are subject; since, by the above treatment, I have generally found them healthy.

As this is a long essay, and may be too great a tax on your readers to peruse, I would give in a single line, the substance of my directions for the successful rearing of young ducks:

Give them animal food, and keep them dry.

EXPERIMENTER.

QUANTITY OF INDIAN CORN TO THE ACRE.

From the New York Farmer.

Meadowbanks, Deerfield, Mass. Sept. 9, 1833.

MR. FLEET:—Your New-York Farmer for this month was received last evening, and I make no delay in replying to the inquiry of your correspondent E. The farmer to whom I referred, whose crops of corn for the last ten years, have averaged more than one hundred bushels to the acre, is Earl Stimpson, esq. of Galway, Saratoga county, N. Y. On a visit to his extraordinary and admirable establishment, in July of the last year, where every agricultural operation seems to be conducted in the most skilful and systematic manner, he gave me this assurance, as I find noted in my journal at the time; and I beg leave to inform your correspondent, that to any gentleman of agricultural taste and science, a visit to this farm cannot fail to yield instruction and great pleasure.

Mr. Stimpson's success, however, in the cultivation of this valuable crop, is not singular. Examples of crops as abundant are on record in your correspondent's own state; and to these, and to some others, as extraordinary, it may be useful and gratifying to refer. I ask leave, therefore, to mention a few, which have been submitted to the most careful examination, and the results established by the fullest proof.

John Stevens, of Hoboken, N. J. produced on one acre, 118 bushels, 2 quarts. "Mr. S. was confident that he would have had considerably more corn, had not his crop suffered very greatly by a thunder storm, which laid the greater part of it down at the time the ears were setting." On this crop a bet of fifty guineas was pending. The motives to exact measurement were such, therefore, as to secure accuracy. This was some years since; the particular date I am not able to ascertain.

Dr. Steele, of Saratoga, in giving an attested account of the crops of Earl Stimpson, in 1821, says that he had eight acres of Indian corn, which yielded 112 bushels to the acre, 896 bushels; 10 do. do. 90 bushels to the acre, 900 bushels; (Memoirs of New-York Agricultural Society, vol. 2, page 73.)

The following individuals applied to the Agricultural Society in Washington county, Penn. in October, 1823, for premiums, with authenticated evidence of the quantity raised per acre, on not less than five acres: Joseph Evans, 136 bushels per acre—John Wolf, 127½ do. do.—Samuel Anderson, 123 bushels 12 quarts do.—Isaac Vanvookens, 120 do. do.—Isaac Buckingham, 118 bushels 1 quart, do. do.—James Clakey, 113 do. do.—Jesse Cooper, 108 do. do.—DeGross Jennings, 120 do. do.

In the same year the following individuals applied to the Alleghany County Agricultural Society, for premiums on their crops: James Anderson, of Ross township, 103 bushels, 17 quarts, on one acre—John Snyder, of do. 103 per acre, on five acres—John Irwin, of do. 105 bushels 20 quarts per acre, on 4¾ acres—Wm. M'Clure, 129 bushels per acre, on five acres. (Memoirs of Pennsylvania Agricultural Society, vol. 6, page 228.)

In 1822, J. & M. Pratt, of Easton, Madison county, N. Y. obtained from one acre, 172¼ bushels—do. do. 161 do.—do. do. 161 do.

In 1824, the same gentleman obtained from four acres 680 bushels, or 170 to the acre.

From public and private testimony I know that the respectability of these gentleman is such as to justify entire confidence in their statements; and their crops were subjected to the particular examination of committees for a premium. The Messrs. Pratt, say they have no doubt of being able to obtain 200 bushels to an acre.

In 1823, Benj. Bartlett, of Easton, Madison county, N. Y. obtained from one acre 174 bushels. The veracity of this gentleman is equally unquestioned; and his, too, was a premium crop.

In 1831, Benjamin Butler, of Oxford, Chenango county, N. Y. states that he raised on one acre, 130 bushels, at 60 lbs. per bushel, or 140 bushels at 56 lbs. per bushel. (New-England Farmer, for Nov. 1831.)

We will come now to some crops which have been produced in Massachusetts, on our cold, and rocky and despised soil. The evidence of these crops is ample and of undoubted character.

In 1820, J. Hunnewell, of Newton, produced 111¼ bushels to an acre.

In 1822, J. Valentine, of Hopkinton, produced 116 bushels, 28 quarts, to an acre—D. Burnham, of Newburry, 117 bushels 8 quarts, do.—T. & H. Little, of do. 116 do.—P. Williams, of Fitchburg, 116 bushels 12 quarts, do.—W. Hull, of Newton, at the rate of 118 bushels, on seven-eighths of an acre.

In 1823, Fitch Winchester, of Southborough, 103 bushels per acre—John Lees, of Newbury, 113 bushels 16 quarts, do.—T. & H. Little of do. 115 bushels do.—Thaddeus Howard, of West Bridgewater, 122 bushels 23 qaarts, do.

1824, Wilmarth of Taunton, 142 bushels per acre.

1825, S. Longley, of Shirly, 112 bushels 21 quarts per acre.

1827, John Andrew, of Danvers, 110 bushels per acre.

1831, Charles Bugbee, of Palmer, in Hampshire county, states that he has produced, on five acres, 540 bushels, or 108 bushels to the acre. (New-England Farmer, for Nov. 1831.)

I might produce many other examples of crops approximating a hundred bushels, and some as large as those which are above referred to. The above are fully attested by the examination of committees; and are, in most cases, certified under oath, with the exception of the last, which rests upon the personal declaration of the gentleman named, whose integrity I have no reason to distrust, though I have not the pleasure of knowing him excepting through the communication above referred to.

Another gentleman, whose name has escaped me, residing in Windsor, Berkshire co. Mass. on the very ridge of the Green Mountain range, in a spot whose aspect was particularly propitious, produced a few years since, 240 bushels of corn on two acres, lying in one piece for which he received the

premium of the Berkshire Agricultural Society. This however, I state from recollection only, and not from any documents in my possession. I have, likewise the assurances of his neighbors, who profess to know the facts.

In the communication to which your correspondent refers, I there stated, that Jesse Buel, Esq. President of the N. Y. Agricultural Society, rated his corn crop, from the measurement of a part of it, at 103 bushels, to the acre; and deemed it practicable to obtain 154 bushels to the acre. The above measurements are all understood to be ripe and shelled corn.

I am perfectly aware that these are extraordinary statements; but I have not a doubt of their correctness. I have not, myself, been able, with the best cultivation that I could apply, though I have never had a very favorable opportunity, to obtain near one hundred bushels; though, in one case, I gathered eighty-six from an acre; but I do not, on that account the less doubt that it has been done. I know, likewise, very well, the utter incredulity of many persons on this subject, who say, "they never can, and never will believe it possible to obtain one hundred bushels of Indian corn from an acre of grouud." In such cases, I ask them if they would make such statements under oath, if they were not true; and if they did make them whether they would not expect to be believed, or feel that they ought to be believed; and then, if they are not willing to render equal justice to others, or if they regard themselves as the only honest people in the world?

I consider the crop of Indian corn as of the highest importance to the country. There is, I believe no farm, in which an acre of ground can be made to yield so much of food for animal life, as by the produce of Indian corn: and no crop by which, where the offal is well managed, so much is returned to the ground to repair the exhaustion, to which the crop has subjected it. Rye and oats are very inferior crops, compared with it. Wheat is much more precarious; and with good cultivation we may reasonably calculate upon two bushels of corn to one of wheat. The superior value of corn fodder, where it is well saved, is, in many cases, a full equivalent for the extra expense of cultivation.

The average amount of this crop, even on the rich alluvians of the Connecticut, is, I apprehend, not more than forty bushels to the acre; and throughout the state of Massachusetts, it does not exceed thirty. It is my opinion, that not one fifth of the extent of land is devoted to this cultivation, which might be advantageously applied. Many a farm of one and two hundred acres, has, perhaps a patch of Indian corn of from four to six acres. This is nothing, and scarcely deserves the name of farming.

The culture of this crop admits, certainly, of very important improvements. The great things which have been done, show us what may be done; and present the most emphatical encouragement to experiment and enterprise. I have seen fine crops of this vegetable growing in those parts of New-Jersey through which I have passed, and the soil seemed to me particularly favorable to its culture. Indian corn will bear to be cultivated longer in succession, on the same land, than almost any other crop; but its productiveness would be greatly favored by a judicious rotation. It is almost the only crop which cannot be too highly manured; and lands of a warm aspect, and which have a large proportion of siliceous sand, intermixed with loam, are peculiarly favorable to its growth. The durability of the grain is greatly in its favor; as, if well saved and housed, it may be kept in our climate for an indefinite period, without injury or deterioration; and the farmer may always regard it as having a cash value. When pork is worth six cents per pound, corn may fairly be considered as worth from seventy to seventy-five cents per bushel, provided the animals to be fatted are of a healthy and thrifty kind, and the corn is applied in the best form, and with proper economy. Its various important uses are too familiar to require remark. It is, in truth, to be considered as the gold dust of a country, where it is capable of being abundantly produced. Yours respectfully,

HENRY COLMAN.

MANURES.

From the Genesee Farmer.

We have uniformly recommended, that dung should be ploughed in, and not applied as a top-dressing, to the surface. This has been said in regard to long or unfermented dung, in which state we have considered it far most beneficial for the farmer to apply it. And the reasons are these: The gases which are evolved by fermentation, and which constitute a food for plants, are specifically lighter than the atmosphere, and consequently escape, and are lost, if the fermentation takes place *upon* the surface; but are arrested by the soil, and fed to the crop, if the fermentation takes place *under* the soil. Besides, the heat generated by the process, warms the recumbent soil, and renders it more pervious to heat and moisture. But these reasons do not apply to manure upon which fermentation has exhausted its powers. This has lost its gases, and its fertilizing properties consist of ponderous substances, which have a tendency to settle, and which the rains carry into the soil. To bury these below the range of the roots, would afford very little benefit to the crop. Rotted dung, therefore, may be benefically applied to the surface, like lime, or *concentrated manure*, and slightly buried with the harrow. Upon winter crops, and a clay soil, rotted dung, superficially buried, serves often to protect grain from the severity of the weather, and to give it a vigorous start in spring. Nor is there any sensible loss, when dung *has* rotted in the yard, in applying it as a top dressing to grass grounds, particularly in autumn. B.

CONCENTRATED MANURES.

From the Genesee Farmer.

It is a term we apply to animal substances generally, and particularly to bones, horns, fleshings, &c., which are applied to the soil. Although little known or appreciated among our farmers, these materials, particularly the first, has become an article of importance in British husbandry. Bones are not only transported from the European, but from the American continent, to the British Isles, to fertilize their fields. Numerous mills have been erected there for breaking and grinding them; and a mill for this purpose has recently been put in operation upon Long-Island, with a fair prospect, as the proprietor informs us, of a

ready market for all the bone-dust he can produce —at 31 cents per bushel. We have seen statements of the comparative expense of manuring, in Scotland, with bone-dust, at 2*s*. 4*d*. sterl. per bushel, and cattle dung, as cheap as it could be had. The advantage was two to one in favor of the bone dust: and the field where it was applied gave the best crop. Its benefits are most apparent upon a silicious soil, and upon the turnip crop. Twenty-five bushels to the acre is a fair dressing. For turnips the bone-dust is placed with the seed in the drill; for other crops it is sown broad cast, and blended with the soil by the harrow. We have used bones, horn shavings and fleshings, the two latter for years, and have found them truly a valuable concentrated manure. The method of preparing the bones is this: a large block, similar to that used by butchers, is hewed on the outside in angles, and pieces of boards, extending two to three feet above the block, are nailed around, so as to prevent the pieces, when broken, from flying off—a space of a few inches being left on one side to admit the use of an axe. The bones, in small quantities at a time, are thrown on to the block, and cut with an axe, till the mass is reduced to small pieces, then thrown out, and a fresh supply put in. They are afterwards passed through a coarse riddle, and the large pieces returned again to the block to be further reduced. Broken bones are not so efficient in immediate effect, as bone-dust; but they are more durable in their benefits. After being broken or ground, the bone should be exposed and slightly fermented before it is applied, if it is intended to impart immediate benefit. Such is the demand for bone-dust in Scotland, that we observe in the last Edinburgh Quarterly Journal of Agriculture that the price has advanced to 3*s* 6*d*. (nearly 70 cents) per bushel. One hundred parts of bones contain, according to Davy,

Solid gelatine, - - - -	51
Phosphate of lime, - - -	37,7
Carbonate of lime, - - -	10
Posphate of Magnesia, - -	1,3
	100

Horns contain concentrated albumen, oil, gelatine and phosphate of lime. B.

EFFECTS OF POOR LAWS.

From Bulwer's England.

The system of public charities, however honorable to the humanity of a nation, requires the wisest legislative provisions not to conspire with the poor-laws to be destructive to its morals. Nothing so nurtures virtue as the spirit of independence. The poor should be assisted undoubtedly—but in what—*in providing for themselves*. Hence the wisdom of the institution of savings banks. Taught to lean upon others, they are only a burden upon industry. The Reverend Mr. Stone has illustrated this principal in a vein of just and felicitous humor. He supposes a young weaver of twenty-two marrying a servant-girl of nineteen. Are they provided against the prospects of a family—do they economise—toil—retrench?—No: they live in Spitalfields, and rely upon *charitable institutions*. The wife gets a ticket for the "Royal Maternity Society,"—she is delivered for nothing—she wants baby linen—the Benevolent Society supply her. The child must be vaccinated—he goes to the hospital for vaccination. He is eighteen months old, "he must be got out of the way;"—he goes to the Infant School;—from thence he proceeds, being "distressed," to the Educational Clothing Society, and the Sunday schools. Thence he attains to the clothing charity schools. He remains five years—he is apprenticed gratis to a weaver—he becomes a journeyman—the example of his parents is before his eyes—he marries a girl of his own age—his child passes the ancestral round of charities—his own work becomes precarious—but his father's family was for years in the same circumstances, and was always saved by charity; to charity, then, he again has recourse. Parish gifts of coals, and parish gifts of bread are at his disposal. Spitalfields associations, soup societies, benevolent societies, pension societies—all fostering the comfortable luxury of living gratuitously—he comes at length to the more fixed income of parish relief—"he *begs* an extract from the parish register, proves his settlement by the *charity school-indenture of apprenticeship*, and quarters his family on the parish, with an allowance of five shillings a week. In this uniform alternation of voluntary and compulsory relief he draws towards the close of his mendicant existence. Before leaving the world, he might, perhaps, return thanks to the public. He has been *born for nothing*—he has been *nursed for nothing*—he has been *clothed for nothing*—he has been *educated for nothing*—he has been *put out in the world for nothing*—he has had *medicine and medical attendance for nothing;* and he has had his children also *born, nursed, clothed, fed, educated, established and physicked—for nothing!*

"There is but one good office more for which he can stand indebted to society, and *that* is his burial! He dies a parish pauper, and, at the expense of the parish, he is provided with shroud, coffin, pall, and burial-ground; a party of paupers from the workhouse bear his body to the grave, and a party of paupers are his mourners."

Thus we find, that public charities are too often merely a bonus to public indolence and vice. What a dark lesson of the fallacy of human wisdom does this knowledge strike into the heart! What a waste of the materials of kindly sympathies! What a perversion individual mistakes can cause, even in the virtues of a nation!

The effects of the poor laws on the social system are then briefly these;—they encourage improvidence, for they provide for its wants; they engender sexual intemperance, for they rear its offspring; by a necessary reaction, the benefits conferred on the vicious pauper, becomes a curse on the honest laborer. They widen the breach between the wealthy and the poor, for compulsory benevolence is received with discontent;—they deaden the social affections of the laborer, for his children become to him a matter of mercantile speculation. "An instance," says Mr. Villers, speaking from his experience in the county of Gloucester, "was mentioned, of a man who had lately lost all his children, saying publicly, that it was a sad thing for him, for he had lost his parish pay, *and that had his children lived he should have been well to do.*"

The poor-laws, administered as at present through the southern parts of the island, poison morality, independence, and exertion;—the encouragers, the propagators, and the rewarders of pauperism. To these evils we must add those in-

curred by the laws of settlement. At present, if there is no labor in one parish, instead of transfering the laborer to another, you chain him to the soil as a pauper. Nor must we forget the mischievous and contagious example of the itinerant vagabonds from Ireland. These Hibernian adventurers, worthy successors of the fierce colonizers of old, are transported in myriads by the blessed contrivance of steam, into a country where "to relieve the wretched is our pride:" with much greater capacities for omni-possession than the English laborer, whom the laws of settlement chain to his parish—they spread themselves over the whole country; and wherever they are settled at last, they establish a dread example of thriftless, riotous, unimprovable habits of pauperism. * * *

But what are the remedies for these growing evils? Every one allows the mischief of the present poor-laws; puts his hands in his pockets, and says, "But what are we to do? This is ever the case; men suffer evils to surround them, and then quarrel with every cure. There is an impatient cowardice in the spirit of modern legislation, which, seeing difficulties on all sides, thinks only of the difficulty of removing them. But, in fact, by a vigorous and speedy reform, the worst consequences of the poor-laws may be arrested—the remedies are not so difficult as they seem.

The principal machinery of reform should lie in the discipline of the workhouse. It is a fact at present, that where the comforts at a workhouse exceed those of the independent laborer, pauperism increases; but where the comforts at the workhouse have been reduced below those of the independent laborer, pauperism has invariably and most rapidly diminished. On this principle all reform must mainly rest. A workhouse *must be a house of work, requiring severer labor and giving less remuneration than can be obtained by honest competition elsewhere.*

The asylums for the aged and the infirm, should on the contrary be rendered sufficiently commodious to content, though not so luxurious as to tempt, the poor. There may well be a distinction between the house for labor to the idle, and that of rest for the exhausted.

"The poor shall be with you always," are the pathetic words of the Messiah; and that some men must be poor and some rich, is a dispensation, with which, according to the lights of our present experience no human wisdom can interfere. But if legislation cannot prevent the inequalities of poverty and wealth, it is bound to prevent the legislative *abuse* of each;—the abuse of riches is tyranny; the corruption of poverty is recklessness. Wherever either of these largely exist, talk not of the blessings of free institutions, *there* is the very principle that makes servitude a curse. Something is, indeed, wrong in that system in which we see "Age going to the workhouse, and Youth to the gallows." But with us the evil hath arisen, not from the malice of oppression, but the mistake of charity. Occupied with the struggles of a splendid ambition, our rulers have legislated for the poor in the genius not of a desire to oppress, but an impatience to examine. At length there has dawned forth from the dark apathy of ages a light, which has revealed to the two ranks of our social world the elements and the nature of their several conditions. That light has the properties of a more fiery material. Prudence may make it the most useful of our servants; neglect may suffer it to become the most ruthless of our destroyers. It is difficult, however, to arouse the great to a full conception of the times in which we live: the higher classes are the last to hear the note of danger. The same principle pervades the inequalities of social life, as that so remarkable in the laws of physical science: they who stand on the lofty eminence,—the high places of the world,—are deafened by the atmosphere itself, and can scarcely hear the sound of the explosion which alarms the quiet of the plains!

RAIL ROAD TO CHARLESTON.

The modus operandi.

From the Columbia Hive.

I will now proceed, as briefly as I am able, to discuss this part of the subject. I do not believe, that until the Carbondale Rail Road adopted the wooden plan it ever was again throught of, 'till the *ad captandum* executors of the Charleston Road put it into execution. The projectors of the road originally talked of graduating it and estimated the graduation at $800 per mile—a sum equal to its proper execution if we recollect what Virginia has done for $1500 per mile; and, if it had not been for the necessity and the costly necessity of beginning it near Charleston there is no doubt that it would have been commenced at Hamburg, which is on the lower edge of the primitive formation. Hence there would have been furnished a large body of stone. This stone mixed with the clay where it was to be had would have been highly useful to coat and perhaps to macadamize the road. The road would have carried the middle country gravel down to the low country and it would have been founded on a basis almost everlasting.

Thus it should be at Columbia. It is similarly situated as to Hamburg, and the plan should be to obtain profiles of the road; and, in my humble opinion nothing farther attempted at present than such a Rail Road as I have described in my last. So, that if its cost be reduced to $2500 or 3000 per mile it will leave sufficient funds to project other Rail Roads—one for instance from Columbia to Camden and perhaps others to Winnsborough, &c. &c. *Steam carriages are the last things to be introduced.*

But as one of the most important objects in view is, the passage of swamps, I will advert to that subject and do most especially call it to the attention of the intelligent; inasmuch, as I am very apprehensive, so powerful is the force of example, that there are many who will think, that the wooden bridge, so perishable of its own nature and especially in swamps, and so obnoxious to fire will be advocated and strange to say, because—*it has been adopted on the Charleston Road!*

However to proofs—What has been the result of the crazy ill-digested and expensive scheme—of passing the Santee at Vances? Fully $25000 have been expended, and such is now its general condition, at the usual season of travel, that combined with the superior accommodation of stages at Columbia, a large number of persons will rather go 30 miles round than pass the Santee at Vances.

I may not be correct in saying, that, if half the money had been spent at Nelson's ferry, it would have sufficed to have created a permanent pass-

way; but I am certain that with the money laid out at Vances,* it certainly would.

The experience in banking has been great—as great as the ignorance of its nature and results has been marked. As to incredulity, it can only be compared to that of the cockneys who, early in the reign of George the 2nd, went to the theatre to see a mountebank get into a quart bottle. However "he was indisposed" that evening and pacified the multitude by promising on the following night to pack himself into one containing only a pint. Thus, the planters have tried to restrain an extraordinary current of water, proceeding from a fall of rain or a melting of snow, with the banks of the same canal as that, to which it had been accustomed to flow in a season of ordinary character.

The consequence has been, that banks have been broken, gullies for mud and whole acres of soil, worth four years since, according to the reckoning of the sapient calculating and humane proprietors $50 or $100 per acre, have been swept away and deposited in Santee swamps. Hence, plantations for which not ten years ago bonds to the amount of $50,000 were given, and many of them not redeemed, are not now worth a quarter the sum, and others for which $35,000 were offered, could not, at this time, find a prudent cash purchaser for $3,500. In short, unless a channel for the extra water of the freshets was provided, all attempts to render the swamp safe for cultivation are as futile as would be the scheme to check the streams of the Mississippi or the Ganges. This has been very clearly and expensively proved this year.

But the bank from the vicinity of dry swamp to the stone landing just above Stateburg, and which cost $12,000, is clear proof of the folly of disregarding nature. Like all other banks, it failed, and although an "object of high expectation and heavy expense, left the state burdened with works not only useless but hurtful." This is the exact character of all the works in question, and plantations which 40 years ago were triennially covered with a thick *alluvium* and at no expense, productive to the owner, have now become channelled into sterility or covered with sand and thus been made useless, and after a very heavy expense wholly unproductive. The folly of one generation has been punished for its inattention to the practices and precepts of its predecessors.

However, it is now time to allude to the passways across the swamps. As I have before observed, my leading motive is, lest some persons should be so enamored of all Charleston and great man's schemes, as he advocated the rail road bridge, instead of the embankment system, to *discuss the relative advantages of perishable wood with those of imperishable earth.*†

In advance, I would observe, for the benefit of those, so sage and prescient as to confound an embankment with a road on it, with one intended to confine or exclude water, that the bank near Stateburg above mentioned, first gave way at where there had run for ages, a natural stream. Hither the greater force of the fluid was concentrated, and as soon as it reached a certain height away went the fabric.—But, supposing that it had been intended for a passway, there would have been substituted for solid enbankment at this natural stream, Gum Swamp, I think, a sufficient number of arches, so, that the descending water would have gradually filled the swamp; above and below the dam, and thus the higher would have fully counteracted the lower pressure.

I would next advert to the expense of embankment, on the supposition, that it is to be performed by "*that class of labor*" not furnished by New or Old England, Germany or France; but by the negroes of Carolina. It is to their employment and the expenditure of the capital of *the state* within *the state* that I look.

We will suppose one of these embankments to be 6 miles or 36,000 feet. An embankment 60 feet base, 20 feet wide and 18 feet deep, can be performed by able bodied negroes, at the rate of one foot per day—thus, on the calculation that they are to be hired at the rate of 25 cents per day, or $75 dollars per year, costing $9,000. This sum will cover the erection of the wooden bridges necessary 'till the work is completed; when, and at the public leisure, I should propose to *found* brick piers or bridges permanently on the granite, that could then be brought, for the purpose, with both ease and cheapness.

To the advocates of wood, I leave the calculation of a wooden road across the same distance of swamp. I think, *but am not certain*, the superintendent calculated on bridging Murray's swamp for $3 per foot. This makes the wooden system infinitely greater in expense than the embankment plan. However, its advocates can state it exactly, and the accounts of the Charleston road will shew what it has cost that company.

But, in the actually depressed state of land in this country, it is impossible to avoid adverting to the subject of its improvement; and, if we think it at all practicable, suggesting a position and a plan which may unite in rendering a service to the landholder, and in conferring a benefit on the state.

In the first place, I would suggest the simultaneous formation of an embankment and a canal with a lock or locks into the river, from the Camden road at Boykin's mill, on Swift's creek, to the late Mr. Ancrum's ferry. The creek to be turned into the canal by a dam, and thus all the low ground below, would only have to contend with back water, a part, if not the whole of which, might be rendered harmless and *possibly* altogether excluded.

In the second place, I would suggest a dam from Garner's ferry through the Garner, Miller and Furman property, to the land where it is high and perfectly safe.—This is one of the most favored situations on the river. Nature has provided a connected chain of lakes and a correspondent range of high land, along which the present road runs, which assures us of her sanction, and that if we open another channel, such a one as the formation of an embankment of 60 feet base, &c. we shall not thwart, but second her efforts. A large mass of water thus brought out, in a double portion to the eastern shore of the last lake, would then have to be provided for; but, it is a matter of little question whether, as in low freshets, the Kenlock dam,

* However, such was the superlative wisdom of the Senate, or its, of course justly founded confidence in the great expender, that the Senators from Camden and Claremont, the two districts most interested in a good work of the kind, voted for this foolish work and wasteful expenditure.

† The errata in this paragraph must be ascribed to the paper from which we copy.—[*Ed Farm Reg.*

did great service to the planters below, so the proposed dam will not confer a similar benefit on them. Eventually ulterior advantages may be obtained to recover a mass of now useless land, and a proper use made of the declining character of the face of the back swamp towards the high land; but, this must be left to time and experience.

The third portion is, the swamp at Fulton. This is less known to the writer; but from the representations of intelligent persons, there is no doubt as good ground for improvement there as above, although perhaps the ground is little lower. To the Charleston Rail Road, the pass way at Fulton is of the last importance, as though an immense portion of the cotton raised in Sumter, will be conveyed to Columbia or Charleston. I say to *either*, and particularly call the attention of Columbia, to the necessity of attracting the cotton of lower and middle Sumter to its market.—It now exclusively goes to Charleston. This should be thought of when the site of the road is fixed.

But the river—the bridges—these are the difficulties and well will it be, if the temptation of the Columbia bridge do not carry the road from Columbia too near the section of country occupied by the Charleston road and too far from that possessing any convenience of the kind. However, the subject is premature; but, I cannot avoid a reference to the April 1832 number, or thereabouts, of the Franklin Institute, where there is to be found an article relative to the German boat bridge, and which, answering as it did, to transport the tremendous mass of artillery it did during the last war, could surely be made available in this country.

AMPHICON.

SALTPETRE IN MEAT.

From the New York Farmer.

It is a matter of regret, that while so much salt meat is made and used, we have not yet acquired the proper knowledge of the best mode to prepare and preserve it; nor is it generally known how noxious salt meat may become by an improper use of saltpetre in the pickle or brine usually employed.

There are various modes of preserving salt meat and fish, by drying, salting, pickling, oiling, smoking, &c.; but I merely mean at present to notice some of the defects and noxious properties of our actual salt meat, either beef or pork.

One of the main defects appear to consist in the useless addition of saltpetre into the pickle, whereby the meat often becomes sour or spoiled, and always acid and pernicious. I never could understand why this substance was added to common salt in curing meat, except that it is said to make it look better. But it ought to be known that the part of saltpetre absorbed by the meat is *nitric acid* or *aquafortis*, a *deadly poison!* whereby our salt meat becomes unpalatable and pernicious. A slight excess of this acid makes the meat sour, or spoils it as we say. It has been suggested to correct this by potash, which re-absorbs this excess; but merely hides the defect without neutralizing the whole poison.

Is it not surprising that we should feed and deal, as a staple of our country, with an article countaining a portion of such active poison as *nitric acid?* In fact, our actual salt meats *are no longer meat!* They are a new pernicious substance, produced by a chemical action of salt upon the flesh of animals. This flesh when fresh and clean consists chiefly of *gelatine* and *fibrine*. Gelatine or jelly is the substance soluble in warm water, forming a broth by boiling, or becoming a jelly by concentration; while fibrine is the fibrous tough part of the meat, which cannot be dissolved, and is therefore unfit for food, while gelatine is the real nutritious part of the meat.

But it is well known that salt meat and even corned beef can no longer afford a broth, and therefore gelatine must have been changed into another substance no longer soluble, nor so nutritious, by the chemical action of salt and saltpetre. To this new substance chemists have as yet not given a name; but is as different from meat as leather is from the hide before it is tanned by the tan-bark or *tannin*.

To this chemical change in meat is to be ascribed all the noxious qualities of salt meat, and the diseases to which those who feed chiefly on it become liable,—sea scurvy, land scurvy, sore gums, rotten teeth, boiles, ulcers, &c.—which we entail on ourselves by using a kind of poisoned bad meat, which we call salt.

This important and doleful fact ought to be well known, or made known generally to all those who raise cattle, cure meat, or eat it in order that they may correct this sad defect.

The first thing to be done is to abandon altogether the use of saltpetre in curing meat. This is indispensable, and no one who is told that aquafortis is the produce of it, ought any longer to use this poison in pickles or brines.

The best substitute for it is *sugar*: a small quantity added makes the meat healthier, sweeter, nicer and equally durable. Let this be known to all our farmers and sailors.

How to make a brine for meat perfectly innocuous is yet a desideratum. Gelatine ought to be preserved in salt meat perfectly pure and soluble, as it is in broth cakes, before any salt meat can be perfectly healthy and equal to fresh meat. But at any rate, by withholding the saltpetre, we divest it of a deadly poisonous substance.

Yours, &c. C. S. RAFINESQUE,
Prof. Hist. and Nat. Sciences,
Elm Place, Lansingburgh, N. Y. Aug. 5, 1833.

MESSRS. EDITORS—It is with no small degree of surprise that I observed in your paper, a communication from Professor Rafinesque, in which the use of saltpetre, for the purpose of preserving meat, is condemned in the strongest terms. A communication from such a source will be received by a great mass of the community as fact, without inquiring whether it be so or not; and as the article in question is most palpably erroneous, I feel it to be due to the public that its errors should be exposed. In the first place it is stated that "the part of saltpetre absorbed by the meat is nitric acid, or aquafortis, a deadly poison," than which nothing can be more erroneous. If Prof. R. can decompose nitrate of potassa (saltpetre or nitre) by means of animal muscle, he has gone one step further in chemistry than any other person. On the same principle may we say that common salt is decomposed, and that the part which enters the meat is muriatic acid, as powerful a poison nearly as aquafortis. Mr. Rafinesque states that he "never could understand why this substance was added to common salt in curing meat, except that it is said to make it look better."—As this is

not the object of the nitre, I will briefly state its use. By the addition of a small quantity of it, the meat is prevented from absorbing a far greater amount of common salt, while, at the same time, it is equally as liable to "keep," and in consequence of this diminished quantity of salt, the meat is rendered more tender, and retains its orginal sweetness to a far greater degree than it otherwise would. I would not, however, recommend a large quantity of saltpetre, as it would thus prove injurious instead of beneficial. About four ounces to every 100 lbs. of meat will be amply sufficient. At the same time a small quantity of refined sugar will materially add to its sweetness.

The very respectable source of the communication referred to above has induced me to be somewhat more lengthy in my remarks than I otherwise would have been, but I trust that the importance of the subject will be a sufficient apology.

Yours, &c. MEDICUS.

EXTRACTS FROM MARSHALL'S "RURAL ECONOMY OF NORFOLK"—AND "RURAL ECONOMY OF GLOUCESTERSHIRE.

Cost of Marl.

The farmers of Woodbastwick, in the southern part of this district, have their marl chiefly from Norwich, in boats round by Yarmouth 40 or 50 miles. Sometimes they bring it, by way of back carriage, from Thorp-next-Norwich, (by land,) about 6 miles; at other times from Horstead, and other neighboring pits, convenient for back carriage: none within 5 or 6 miles.

The usual quantity set on, is 8 or 10 middling loads an acre. At Norwich they pay one shilling—at Horstead 18*d.* a load, uncallowed.*

The carriage (as back carriage) is reckoned worth about 3 shillings or 3 shillings 6 pence; so that it costs them about 4 to 5 shillings a load; or 50 to 60 shillings an acre, (or from $11 66 to $16 33.)

The marl brought by wherries, is worth, at the staith, [where landed] about 4 shillings the middling load.

* * * * *

Yesterday, procured the following particulars of the expenses upon Norwich marl, brought round by Yarmouth, and landed at the staiths, at Woodbastwick.

Cost of a chaldron (*weighing* a chaldron of coals) at Thorp, and putting it on board the lighters, 8 pence; lighterage to Woodbastwick, round by Yarmouth, 50 miles, 16 pence; together, 2 shillings a chaldron. Two chaldrons make a middling cart load; 2½ chaldrons, a good load: 7 or 8 large loads are esteemed sufficient for an acre—the expense upon which stands thus:

The marl, (suppose 18 chaldrons,) at 2 shillings,	£1 16 0
Filling it at the staith—carting to a medium distance, and spreading about, 15 pence a load,	1 2 6
Expense per acre,	£2 18 6

* These prices are for marl as it lies in the pit. "Uncallow," in *Norfork language*, means the earth which lies over the "jam," or body of marl. It may be gathered elsewhere from the author, that this marl is highly calcareous—[*Ed.*

With the marl ought to be, and frequently is laid on a quantity of Yarmouth muck, equal in expense to the marl.

After this dressing, for about 10 years, the soil, (a sandy loam, but stronger and deeper than the Norfork soil in general) throws out very great crops; and with the usual teathe* and ordinary dungings, will feel the effect of the marl for 10 years longer.

Before the use of marl, (which has not been brought by water, I apprehend, above 10 or 15 years,) the farmers could grow no turnips; the land letting for 10 or 12 shillings an acre: now the turnips upon it are remarkably fine; and the land lets at full 20 shillings an acre; a rent the occupiers could not pay, were it not for marl.

The distance between Woodbastwick and the marl pits at Thorp-next-Norwich, is not, by land, more than 6 or 7 miles; yet the farmers find it cheaper to fetch their marl 50 miles by water, and then carry it, perhaps, half a mile from the staith to the ground, than fetch it these 6 or 7 miles by land. What an advantage, *in some cases*, is water carriage to a farmer, and consequently to an estate.

Unproductiveness of a Fairstead.

The Bullock Hill, at St. Faith's, is said to receive no benefit from the *teathe* of the bullocks, which every year are shown on it daily, during a fortnight or three weeks.

This year it was in wheat; and if one may judge from the stubble (notwithstanding the wheat was dunged for,) the crop was a very indifferent one. The soil a lightish sandy loam.

This is an interesting fact. It is said to be owing to the worthlessness of the teathe of "drove bullocks." This I much doubt, however; for the bullock, being many of them in high case, and kept in grazing grounds about St. Faith's, some of them perhaps, within a quarter of a mile of the Hill, the driving is little more than the driving of sheep to a fold. Some of them may, no doubt, come on to the Hill immediately from Scotland; and they are all of them, of course, driven more or less; and there may be some truth in this opinion.

That the teathe of lean stock, and more particularly of cows, is much inferior to that of fatting bullocks, is a fact universally acknowledged throughout this country; and this may in some measure be accounted for from the oleaginous matter carried off by the milk of cows, and imbibed by the vascular carcasses of lean stock in general. On the same principle, if stock be hard driven, and much exhausted by perspiration, and want of regular nourishment, their teathe may become insipid and of little use of land; consequently, this reasoning may in part be applicable to the Bullock Hill at St. Faith's: but, as before has been observed, there are numbers that come in good condition, and from good pastures, at a very small distance from the Fair-hill, and there is no obvious reason why the teathe of those should not be nearly equal to that of other fatting cattle: therefore, upon the whole, it seems that driving alone does not produce this interesting fact.

May we not venture to think it possible, that

* "Teathe" is a provincial term used to express the dung and urine derived from the penning or grazing of cattle on arable land.—[*Ed.*

land may be satiated, or tired, even of the dung of cattle? The Hill in question has been the site of a large fair for cattle, during time immemorial; perhaps were the fair removed, and the soil manured with lime, marl, or such other *new* manure as experience would point out, it might continue to throw out great crops for many years. * * *

[As a strong contrast to the foregoing remarkable fact, we present the following passage from the same author's "*Rural Economy of Glocestershire.*" The Cotswold soil here spoken of is previously stated to be "generally a calcareous loam," lying on a" calcareous rubble."]

Durable Effects of Dung.

The effect of *dung* on the Cotswold soil is extraordinary. There is an instance produced of its lasting near fifty years! Its effect is evident, in a piece of wheat now growing (May 1788] on a patch, which was lately common field land, but which now makes part of an enclosure.

But this extraordinary effect is on land which lies at a great distance from the dung yard; and is perhaps, no more than an incident, [striking in those days] of the efficacy of a *new* manure,—even of dung,—on land which has not been accustomed to it. It is well known that the dung of sheep [the sheep-fold,] is singularly beneficial to land which has not been folded upon; and there seems to be no reason why the dung of horses and cattle should not be similar in their effects. The duration is the only thing extraordinary. The retentive nature of the soil is the probable cause of it. Had not the fact been well authenticated by a most intelligent husbandman, [Mr. John Craddock of Northleach] who has probably seen every crop which has grown upon the land since the circumstance took place, I should not have thought it an object of notice.

Straw Feeding.

I met with an idea here [Glocestershire] that cattle may be satiated with straw; or, in other words, may be served to it in too great plenty. It has been observed that after a dry summer, when straw is scarce, and the cattle have it dealt out to them regularly, they thrive better than when, after a plentiful year, it is thrown before them in profusion, from the thrashing floor. Not through the superior quality of the straw in a scarce year; as these effects have been observed to be produced from the same straw.

This subject is by no means uninteresting to those who winter large quantities of cattle; I have observed, in Yorkshire, where cattle are kept tied up, and of course are regularly fed, that they in general thrive better at straw, than in the south of England, where they go loose among a much greater plenty; but whether it proceeds from the warmth, from their resting better, from the breed of cattle, or from their being regularly fed, and *eating with an appetite*, I will not pretend to decide.

REMARKABLE BENEFIT FROM GYPSUM.

From the Genesee Farmer.

Messrs. L. Tucker & Co.—Please inform our friend, the Plough-Jogger, that Agricola has stated nothing but the truth about the fourteen acre lot. The lot is situated about a mile east of Lansingburg, on the Hudson, in Rensselaer county; and the principal facts stated by Agricola are well known to more than a hundred credible inhabitants of that village at the present time.

The land was originally as poor as self-righteousness; and for fourteen years it scarcely afforded pasture for one family. It was then ploughed five times, harrowed five times, and at each ploughing and horrowing, the stones were picked off, and sowed to wheat and clover, and plastered with one and a half bushels of plaster to the acre. In sowing the plaster, one land was omitted through mistake, and this land could be seen from the Mohawk falls, four miles distant; it was covered with stunted clover and mulleins, while the land adjoining was covered with clover three feet long. It was afterwards divided into four acre lots. Agricola dug the post holes and set posts, and afterwards took from one lot six hundred and fourteen cart loads of stone, and the three lots were covered with stone at least three inches all over the surface. There is no mistake about this, as Ulmus would say—for I know it by feeling, and feeling is the naked truth.

Now, why was the land omitted in plastering covered only with stunted clover and mullein, while the adjoining land was covered with a luxuriant growth of clover? The land originally was very poor, and I should think no stimulant could promote such luxuriance,—for twelve years, unless it was a powerful agent, and permanent in its effects.

Is it not possible that the plaster operated in attracting the vegetable food from the atmosphere? It certainly could not find it in the earth. When manures, either vegetable or animal, are buried in the earth, they are slowly resolved into carbonic acid gas, which is absorbed by the earth, and yielded to the future crop by degrees, and in such portions as the capillary vessels can take in. The carcase of a dead animal, grass, or weeds, after decay on the surface, we all know, do little good to the crop—the virtue is blown away by the winds, and is lost to vegetation; but if buried in the earth at a proper depth is yielded slowly, and the plaster of Paris may very possibly have an agency in retaining this vegetable food near the capillary vessels of the plants, so that it can be taken in and assimilated. I think if the Plough-Jogger will consult his reason, be will guess that plaster may very possibly do good without stimulating the earth.

Potter, August 29, 1833. AGRICOLA.

EXTIRPATING SASSAFRAS.

Scotland Neck, Sept 23, 1833.

DEAR SIR:—In answer to the queries of *Anti-sassafras*, extracted in the Farmer, from the Farmers' Register—if Anti-sassafras will cut all the sassafras bushes down in the spring of the year, that are of any size, and pasture the land with cattle and sheep for two or three years in succession, it will effectually destroy them. I had a piece of land thickly set with them; I pastured it with cattle and sheep, the years 1831 and 1832, to destroy it; in the fall of 1832 I broke it up and sowed it with wheat: I rode over it a few weeks past and could not see a single sprout of it. Three years will effectually destroy it, and I think two is sufficient. Sheep and cattle are very fond of the sprouts, and they continue to trim them off as soon as they make their appearance. To satisfy

any person of the correctness of this method, let him notice, when passing along a lane where the field is infested with this growth,—and plenty may be seen in the enclosure, but not one outside the field, unless it is two high for cattle to trim the leaves off. I am satisfied it is a great impoverisher.

Respectfully, your obedient servant,

WM. R. SMITH, Sen'r.

GAMA GRASS.

Extract of a letter from N. Herbemont, Esq. to the Editor of the Southern Agriculturist.

It is supposed that this grass is rather too coarse and rough. It would, perhaps, be so, if it were kept till it is too old before it is cut for fodder. As I intend to save all the seed of it in my power, in order to plant as much of it as I can, I reserved only a small portion of the grass for cutting, and it was cut for the fourth time this season, on the 27 July. It might have been cut at least once more, if I had begun earlier as I should have done; and I expect to cut it at least three times more. I wish I may find it practicable to send you, sir, a specimen of the hay, as also specimens of the stalks with their various spikes for botanical examination.

The hay I have no doubt, would be found excellent. As to the amount of produce, it is probable that the account I have seen, stating that it would be about 300,000 lbs. of green grass of the various cuttings of one season, per acre, the person that made the supposition may have been rather too sanguine; but there cannot be any doubts of its being the most productive and easily cultivated grass ever tried in this country.

GAMA GRASS.

Extract from the Southern Planter.

About 18 months since, I received some seed of the Gama Grass from Mr. Legare, and planted them in my garden, only three came up, enough however, to enable me to identify with it the other grass, which I soon after noticed and watched till it seeded, it was the Gama Grass. Mr. Bugg, to whom I had given some of the seed, received from Mr. Legare, found the same grass growing in Mr. Woolfolk's plantation on the Chattahoochee river, six miles below Columbus, where we both procured roots and seed. I subsequently found it on the town common, where I also procured seed and roots. I have since seen it growing in the corners of a fence about 5 miles from La Grange, in Troup county. Dr. Ingersoll says he has it in his plantation 3 miles below Columbus, and Mr. Biggers in his, about 8 above. I have lattely seen a description of the grass by a Mr. Mears, I think, which is so nearly correct, that persons cannot fail to identify wherever they see it. I planted nearly a quart of seed last spring, about one half came up, and is now from two to three feet high. I have not cut it. Not many of the old roots which I transplanted lived, but from those that did live, I have saved about a pint of seed, a part of which I will send you the first opportunity. As the seed are enveloped by a very hard shell, some have advised planting them in the fall of the year, and though I have lost many by differing till spring, I cannot agree with them, for if placed in the open ground, the rats and mice are sure to eat them; for they seem to be as fond of the seed as cattle are of the blades. The better plan, I think, would be to put the seed in a box of earth, and place it away in the cellar or some other convenient place till spring, and then sow in drills in the open ground, and afterwards manage as has been directed by Mr. Magofin and others. I have noticed that the grass is never found in large quantities, at least I have never found more than twenty or thirty bunches together.

ON THE ADVANTAGES AND DISADVANTAGES OF LOCATING A PLANTING INTEREST IN THE SOUTHWESTERN PRAIRIES.

From the Southern Agriculturist.

Dear Sir,—In my last communication,* I tried to point out as correctly as my opportunities and observation enabled me, the advantages and disadvantages of locating a planting interest in such of the Prairies of the West, as I have seen. I shall now attempt some account of the other lands there, and give a few hints as to the first steps that should be taken by a new settler.

The other lands are classed by planters into the red and grey uplands, and the river lands. The river lands are generally strips of alluvial soil immediately on its margin, rather narrow but very rich, called the first low grounds; the second low grounds are much wider but not so rich; and there are large quantities of lands in the "bends," of which there are a great many, from the crookedness of the river. These "bends" or "necks," often in the shape of a horse shoe, present generally, on their upper sides, high bluffs of red land, not overflowed by the river, except from very extraordinary freshets, such as the Yazoo freshets, of 1796, and the freshet of this spring; and on their lower sides, lands frequently overflowed, but richer on that account. The river lands are generally light isinglass sands, that work freely with both plough and hoe, and produce more cotton for equal fertility than corn, and more cotton, and perhaps more corn than the Prairie, and are more free from its little discomforts. These lands, though at this time more healthy than ours, may be considered as sickly and are liable to inundation, with its disadvantages of injury to your stock, and the removal of your fences, &c.

The freshets in the Alabama river, though not as regular in their periodical returns as in the Mississippi are generally up in the latter part of the winter and spring, and but rarely, indeed, during the crop-making season. I am informed there has been but one summer freshet to injure a crop within the last fifteen years; it is much to be doubted whether this will continue to be the case, when the the country above becomes more cleared and drained. The freshets on this river for fifty miles below, where it receives the waters of Coosa and the Talapoosa, rise to sixty-five feet and more above ordinary low-water mark; and then do not cover the high bluff lands. The great convenience of having good navigation at your door for the most bulky articles, with the expedition and facilities offered by the steam-boats, which pass up and down the river, on almost every day during the winter and spring, place these lands deservedly very high.

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* Farmers' Register, No. 5, p. 277.

The red and grey uplands lay very level and do not wash, are easy to work, and free from the casualities of the river; and the disagreeableness of a residence on the Prairie, and make the hansomest plantations. They did not produce as much per acre as the swamp or the Prairie, and they suffer more from drought, and I think they are not as durable; but their conveniences are so great, and you are sure of a pretty good crop, and your lands lay together so handsomely that they also stand very high, and I think are more in request than any other lands by the residents. They are more healthy than the river lands, but less so than the Prairie. The grey lands are lighter and bear droughts better, but are not generally as productive. To contrast these lands with each other, I should say, the red lands make the hansomest plantations, and the most comfortable residences, and are liable to the fewest casualities and diseases, but their general crops not as large as either of the others. The river lands have the most substantial conveniences, make large crops, and have a great advantage in the navigation, but are less healthy than the others. The Prairies make the largest crops and have most health, but make very unpleasant residences and bad roads, and are liable to the rust, a disease uncertain in the extent of its injury, or to what kinds of Prairie it may extend.

With these advantages and disadvantages before him, of the different kinds of land, a settler will try so to locate his plantation as to avoid the prominent objection to each. If you select a river or a red-land plantation, the same rules that would guide you in what lands you would plant if here, ought to guide you there: I shall, therefore, say nothing about them. If a Prairie plantation is selected, and I could recommend one settled at double the price of one all in the woods as cheaper, I would advise, that the bald Prairie, part of the old land, should be put in corn, because it rusts the cotton, and the wood-land, both old and new, and the bald, if new, to be put in cotton, because the bald is very little liable to rust cotton till it has been planted three years. The only difficulty of making a crop on a bald Prairie the first year is, that the land is so much bound in a close mat of coarse grass roots, that it cannot produce, without its ploughed up sufficiently early for the frosts of winter to strike through it and moulder it down. One of our broom-straw old fields will give you some idea of a bald Prairie, both as to the apearrance of its growth and the situation of the soil as affected by its roots. Newly cleared land gives a more certain rise of cotton and a surer crop than old land, and requires for its preparation the same treatment from hoe and plough as here. The general preparation for the crop should be as it is here among good planters: though it is certainly true, that fine crops are made under a preparation of the soil, and a cultivation of them entirely too slovenly to be called husbandry, or to give the planter any credit for it, as it all belongs to the soil and the season.

It is an object of first consequence to clear land for cultivation; therefore, after fixing your negroes in comfortable buildings, and a good pen for your mules, you, should push your clearings, and put your plantation under one fence. The most expeditious mode of clearing, is to grub nothing, but to cut with the axe the bushes even with the ground, and to cut down the small growth under four or five inches in diameter, and all the rest to girdle or ring by cutting through the bark and a little into the sap-wood all around the tree, and to do so little of the cutting down as to enable each laborer to go over from one-third to one-half acre per day. Where the stump of the tree stands, you cannot plant, and the body may as well stand above it, for at any rate the first and second years. Another kind of girdling is to cut in with the axe in single chops, following each other in the circle, without taking the chip out; this mode is about four times as fast as the other, and yet, perhaps, not to be preferred, because as you have no present means of knowing whether the communication of the sap has been cut off, you are very liable to be imposed upon with bad work. Where you wish to make certain of the trees dying the same year, you must girdle deep enough to go through the sap-wood. I have seen large oaks in the spring and autumn wilt on the same day they were girdled deep, that is into the red wood. The trees easiest killed are the ash, the maple, the pine, the various kinds of oak and the cotton; the trees most difficult are the scycamore, the gums, the beech, the elm, the wawhoo, and the lyn. You will of course pile your brush and burn about such trees, and leave the others to the stroke of the axe. Where the undergrowth is principally cane, and a thick growth of it, you cut down and girdle nothing, but cut down the cane, which when seasoned, you put the fire to and it does all the rest of the cleaning for you; but the cane must be close so as to make a strong fire. Where it is sparse, you will have to clear as above discribed. When you are clearing have all the stuff suitable for your buildings cut and hauled to the spots on which they are to be erected, because after the crop is laid by, you cannot haul out of the cultivated fields, and your teams will not be in a suitable condition after making a crop. In ordinary years you may calculate on taking off a large portion of your men from the middle of June till the middle of August or first of September, to go to work on your buildings; you should have a strong team of oxen.

I believe I have given you a faithful account of the lands and the various matters that are to be taken into consideration, in making choice of a plantation, with some of the steps preparatory to commencing a crop. The best mode of attending a crop, and the quantity that may be attended to the hand, are matters I do not feel competent to advise upon, and would therefore recommend the practice of the best planters of your neighborhood. The usual mode of cultivation is different from ours, and possesses much advantage over it in its greater expedition—they neither bed nor draw earth to the cotton with the hoe, their almost exclusive object is to draw the grass and weeds from the plant, and leave the rest to the exertions of the fine soil. The broad skim plough is very much used.

The want of room on my paper admonishes me it is time to conclude this long letter. It contains so little matter of general interest to your readers, that I send it with hesitation, assuring you it is entirely at your discretion, either to put it in your columns, or into the fire.

Your's, &c.

A PLANTER.

July 20, 1833.

FITZHERBERT'S BOKE OF HUSBANDRY.

From the Edinburgh Farmers' Magazine.

I was much amused by the review of Blyth's Improver Improved, in your last number; and happening to have in my possession an old work or two on the subject of agriculture, it may perhaps be interesting to some of your readers to know the state of the art nearly a century before the appearance of Blyth's book. The first publication to which I allude is from the pen of Fitzherbert,* or Fitzherbard, as the title-page specifieth. I am rather surprized, that Blyth, in his enumeration of 'former gallant instruments,' makes no mention of Fitzherbert, particularly as '*The Boke of Husbandry*,' of which we are now treating, made its appearance so early as 1555, whilst that of Blyth was not published till 1652, 97 years after. It was a celebrated work in its day, and is quoted by Googe in his English Husbandry, and by other writers of his standing. In analyzing this book, I shall make such extracts from it as I may deem most interesting to readers of the present day; and if these meet your approbation, shall in a future number present you with a similar account of Googe's book.

After a short preliminary address, our author proceeds to point out and describe '*divers maners of plowes*.' with the '*names of all partes of the ploughe*' then '*the tempering of plowes*.' And here let me observe, that Blyth, in his rules to make a plough go easily, without wheels to regulate the depth, only mentions the letting up or down the *backband*, an imperfect method, which the writer of that article justly adds is superseded in Scotland by the *present* improved muzzle. Now, it is somewhat remarkable, that Fitzherbert, nearly 100 years before Blyth, has very particularly described this 'present improved muzzle,' used in his day to regulate both breadth and depth of furrow. Take his own words:—Sum 'plowes have a band of yron, triangle-wise set 'there as the ploughe eare should be, yt hath III 'nickes on ye furder side. And if ye wyl haue 'his ploughe to go a narow forow, as a side forow 'should be, then he setteth his fote team in the nicke 'next to the plough beam; and if he wil go a 'mean brede, he setteth it in the midle nicke, yt is 'best for sturring; and if he wold go a brode fo-'row, he setteth it in ye utmost nick, yt is best for 'folowing. The whiche is a good way to kepe the 'brede and some tempored, but it serueth not the 'depenes: and some men haue in stede of the 'ploughe fote a pece of yron sette uprighte in the 'further end of the ploughe beam, and they call it 'a cocke, made with two or three nickes, and that 'serueth for depenes.'

The next section is a curious discussion, 'whe-'ther is better, a plough of horses or a plough of 'oxen,' which, after enumerating the advantages and disadvantages of each, he sums up in the following words: 'And if anye sorance come, or the 'horse ware old, brused, or blinde, then he is lytle 'worth. And yf any sorance com to an oxe, or he 'waxe olde, brused, or blynde, for IIs. he may be 'fed, and then he is man's meate, and as good or 'better than ever he was. And the horse when he 'dieth is but caryon. And therefore me semeth al 'thinges considered, the plough of oxen is much 'more profytable than the plough of horses.'

The next chapter is thus entitled, 'The diligence and the attendance that a husbande should 'giue to his workes, in maner of another prologue, 'and the special grounde of al this treatis.' Next, 'How a man shuld plow al maner of tymes in the 'yere.' Then, 'How to sow both pees and beanes.'

The following is an article which it may not be amiss to prescribe to the agriculturists of the present day, namely, 'Sede of discrecyon.'

'There is,' says our author, 'a sede that is call-'ed discrecyon, and yf a husbande haue of that 'sede and myngle it among hys other cornes, they 'wyl grow much the better, for that sede wyl tell 'hym how many castes of corne every lande ought 'to haue. And a young husbande, and may for-'tune some old husbandes haue not sufficient of that 'sede, and he that lacke let him borow of his 'neighboures that haue. And his neighboures be 'unkynd if they wil not lende this younge hus-'bande parte of this sede: for thys sede of discre-'cyon hath a wonders propertie, for the more that 'it is taken of or lent of, the more it is. And ther-'fore me semeth it should be more spiritual than 'temporal, wherein is a great diversitie,' &c. &c.

Having stated 'howe all maner of corne shoulde 'be sowen,' he tells us, 'the best property that 'longeth to a good husbande is to sow all maner of 'corne thyck enough;'—a good old fashioned rule, which it would be well if some of our modern theorists would pay attention to.

In describing the process of harrowing, he notices an ox harrow very heavy, 'goode to breake the great clottes, and to make much molde;' and observes, justly enough, 'yt were better for the 'oxen to go to the ploughe two daies, then to har-'rowe one day.' We are too apt to fancy that any horse, however old, will do to go to harrows. The horse-harrow (a lighter kind) is then described, and also one used in the neighbourhood of Rippon, having 'tindes' of wood. Then follow instructions to 'mowe grasse,' to make 'rakes and forkes,' to 'tedde and make haye,' 'sheare wheate, rye,' &c. in all which I observe but little difference from the modes in use at the present day. Speaking of sowing wheat, &c. he says, 'In Essex they use to 'haue a childe to goe in the forowe before the horses 'or oxen, with a bagge, or a hopper full of corne, 'and he taketh his handful of corne, and by lytell 'and lytell casteth it in the said forowe. Me seem-'eth that childe ought to have much discrecyon.'

How little does this differ from the well known practice of dibbling, so general in Norfork and Suffolk, in this *improved age!*

A variety of pages are occupied with instructions on the management of sheep, cattle, &c. some fanciful enough, others bordering on superstition, but for the most part, practically useful. The reader will smile at the following precaution in the case of murrain. 'And it is commonly used 'and cometh of a great charitie, to take the bear 'head of the same beaste,' (one that died of the murrain,) 'and put it upon a longe pole, and set it in 'a hedge faste bound to a stake by the hie-way

*Sir Anthony Fitzherbert, the supposed anthor of the work before us, was an eminent lawyer and judge of the time of Henry VIII, and died in 1538. If this is correct, the date of my copy (1555) implies it to be a later edition. If he was *not* the author, I should be obliged to any of your correspondents, who have the means of ascertaining, to inform me *who was*. S. T.

An earlier edition of 'The Boke of Husbandry' is dated 1534. Con.

'side, that everye man that rideth or goeth that 'waye maye se and know by that signe that there 'is sycknesse of catel in that township. And the 'husbandes holde an opinyon that it shal the rather 'cease.'

'The turne,' or sturdy as they call it in Scotland, he says he has frequently seen cured by raising the skin, turning up a piece of the skull bone, and taking out a bladder of water from over the brain. How little do we know of this common and fatal disorder, more than this *old faskioned* farmer has told us? We generally content ourselves with the latter part of his advice respecting it. 'If,' says he, 'the beast be fat, and any reasonable meat 'upon him, it is best to kill him, for then there is 'but little losse.'

We next proceed to the management of hedges, orchard trees, &c. after which the work takes a more serious turn, and not only embraces various points of domestic economy, but goes on to enjoin the practice of many religious duties. I make no apology for the following extract, the quaintness and good sense of which will, I hope, justify its insertion at length.

'*A shorte information for a yonge gentylman that entendeth to thryue.*

'I advise him to gette a copy of this presente 'boke, and to rede it from the beginnyng unto the 'endyng, whereby he may perceive the chapters 'and contentes in the same, and by reason of often 'readyng he may perfyte what shulde be done at 'al seasons. For I lerned two verses at grammer 'scole, and those be these—

'Gutta cauat lapidem non vi sed sepe cadendo,
'Sic homo fit sapiens non vi sed sepe legendo.—

'A drop of water perseth a stone not alonly by 'his owne strength, but by his often falling— 'Ryghte so a man shal be made wise not alonly 'ley by him self, but by his often reading, and so 'may this yonge gentilman, according to the sea- 'son of the yere, rede to his servauntes what chap- 'toure he wyl—And also for any other maner of 'profite conteined in the same, the which is neces- 'sary for a yonge husbande that hath not the expe- 'ryence of husbandry, nor other thynges conteyn- 'ed in this presente boke, to take a good remem- 'braunce and credence thereunto: for there is an 'olde sayinge, but what auctoritye I cannot tell, 'It is better the practice or knowledge of an hus- 'bandeman well proved, then the science or cun- 'ning of a philosopher not proved; for there is no- 'thing touching husbandrye, and other profytes 'conteyned in this present booke, but I have had 'the experience therof and proved the same— 'and over and beside al this boke, I wil advise 'him ryse betime in the mornynge, and to go 'aboute his closes, pastures, feldes, and specially 'by the hedges, and to haue in his purse a payre of 'tables, and when he seeth any thyng yt wolde be 'amended, to wryte it in his tables, as, an he fynde 'any horses, mares, beastes, shepe, swine, or geese 'in his pastures that be not his owne. And per- 'adventure though they be his owne, he wold not 'have them go there, or to finde a gappe or a sherd 'in his hedge, or any water standing in his pastures 'upon his gras whereby he may take double hurte, 'both losse of hys gras and rottyng of hys sheepe 'and calves, &c. &c. For a man alway wander- 'yng or goying about, somewhat findeth or seith 'that is amisse, and would be amended, and assone 'as he seeth any such defautes, then let him take 'oute his tables and wryte the defautes, and when 'he cometh home to dyner, supper, or at nighte, 'then let him cal his bayly or his head servaunte, 'and to shew him the defautes that they may be 'shortly amended, and when it is amended, then put 'it out of his tables: thys used I to doe X or XII 'yeares or more, and thus let him use daili, and in 'short space he shal set much thynges in good or- 'dre, but daylye it wil haue mending. And if he 'cannot wryte, let him nycke the defautes upon a 'sticke, and to shewe his baily as I sayd before. 'Also take hede both early and late, at al times 'what maner of people resorte and come to thy 'house, and the cause of their comyng, and spe- 'cially yf they bring with them pitchars, cannes, 'tankardes, borels, bagges, wallettes, or bushel- 'pokes. For if thy servauntes be not true, they may 'doe thee great hurt and themself litel aduantage, 'wherefore they would be wel loked upon.'

Next follows 'The Wives Occupacion.' How our modern wives may relish the various avocations assigned them by honest Fitzherbert, I know not; but to show them 'whereby they shuld not be ydle at no tyme,' I subjoin a list of *a part* of the duties expected from them (in 1550.)

'Fyrst in the mornyng when thou art wakend 'and purpose to ryse, lift up thy hand and blis thee 'and make a signe of the holy crosse. *In nomine 'patris et filii & spiritus sancti. Amen.* And if 'thou saye a pater noster, an ave and a crede, and 'remembre thy maker, thou shalte spede much the 'better; and when thou art up and readye, then 'fyrst swepe thy house, dresse up thy dyshebord, 'and set al thynges in good order within thy house, 'milke the kie, socle thy calves, site up thy milke, 'take up thy children, and array them, and provide 'for thy husbandes breakfast, dyner, souper, and 'for thy children and servauntes, and take thy 'parte with them—And to ordeyne malt and corne 'to the myl, to brew and bake withal when nede 'is—And mete it to the myl, and from the myl, and 'se that thou haue thy measure againe, besides the 'tole, or elles the mylner dealeth not truly with 'the, or els thy corne is not dry as it shuld be.' After a variety of other employments, he says 'lette thy distaffe be alwaye redy for a pastyme, 'that thou be not ydell. And undoubted a woman 'cannot get her livinge honestly with spinning on 'the distaffe, but it stoppeth a gappe and must 'nedes be had.'

What will the ladies of 1817 say to such wholesome advice as the following?

'It is a *wives* occupacion to winow al maner of 'cornes, to make malte, wash and wring, to make 'hey, to shere corne, and in time of nede, to helpe her 'husbande to fill the muckle wayne or donge carte, 'dryue the ploughe, to lode hay, corne, and such 'other. It may fortune sometime,' says he, 'yt thou 'shalte have so many things to do that thou shalte 'not wel know where is best to begyn. Then take 'hede whych thing should be the greatest losse if it 'were not done, and in what space it would be 'done, and then thinke what is the greatest losse, 'and ther begin;' so very anxious was the good man to keep the ladies out of mischief. He next admonishes both husband and wife to live within their income, or, as he aptly styles it, 'eate within their tedder;' and after laying down many excellent maxims of domestic economy, he proceeds to state his opinion of the causes of the increased lux-

ury of the times—these are three. 'The *first* is pro-'digality in outragius and costly array far above me-'sure; the *seconde* thynge is costly charge of deli-'cious meates and drinkes; the *thyrde* is ouragius 'play and game far above mesure.'

'*Prodigalitie in outrageous and costly aray.*

'I have sene bokes of accompt of the yoman of the 'wardrobes of noblemen, and also invitories made 'after theyr decease, of theyr apparell, and I doubt 'not but at this day it is XX times more in value 'than it was to such a man in degree as it was C 'yeres agone, and many times is geuen away or it 'be halfe worne, to a symple man, the which caus-'eth him to were the same, and another symple 'man, or lytell better, seynge him to were suche 'rayment, and thinking in his minde that he may 'were as good rayment as he, causeth him to bye 'suche other to his great cost and charge, and above 'measure, an an yl ensample to al other, and also 'to se mennes servauntes so abused in their array, 'their cotes be so side that they be faine to tucke 'them up when they ryde, as women do their curtles 'when they go to market or other places, the which 'is an inconvenient sight. And furthermore, they 'have such playtes upon theyr brestes and ruffes 'upon theyr sleves above their elbowes, that an 'theyr master or theyre selfe had never so greate 'neede, they cold not shote one shute to hurt theyr 'enemyes till he have caste of his cote or cut of 'his sleves: thys is far above measure, or comon 'weale of the realme.'

The increase of extravagance in 'delicious meate and drynke' is not less curiously stated.

'I have seen bokes of accompt of housholde and brumentes upon the same, and I doubt not but in delicious meates, drynkes, and spices, ther is at 'thys day foure times so much spente as was at 'these dayes to a like man in degree; and yet at 'that time there was as much byeffe and mutton 'spent as is now, and as many good householdes 'kepte, and as many yomen wayters therein as bee 'now. This began wyth love and charitie, when 'a lord, a gentylman or yoman desyreth or pray-'eth another to come to dyner or souper, and by-'cause of his comyng he wold have a dish or two 'mo then he wolde have had yf he had byn away. 'Then of very love he remembrynge howe lov-'ingely he was biden to diner, and howe welle he 'fared, he thinketh of very kindness he muste nedes 'bid him to dyner agayne, and so ordeyneth as 'many maner of such dyshes and meates as the 'other man dyd, and two or thre mo, and thus by 'litle and litle it cometh far above measure. And 'began of love and charity, and endeth in pride and 'glottony, whereof S. Jerome sayth,' &c. &c.

The latter part of this singular publication is chiefly occupied by instructions on moral and religious points. Having, however, already taken up so much of your time, I will only give a part of his concluding section.

'What is the greatest offence that a man may 'do and offende God in? 'In myne opinion it is 'to be in dyspayre of the mercy of God. And 'therefor, whatsoever that thou hath done or of-'fended God, in worde, worke, thoughte, or dede, 'be never in despayre for it: for Isodorous saith, '"He that despayreth to have forgivenesse of his 'synnes, he synneth more in the despayringe than 'he dyd in the synne doing."'

With the following 'protestacion,' at once expressive of his simplicity and sincerity of intention, the author concludes his labors:

'Be it knowen to al men, spiritual and temporal, 'that I make protestacion, before God and man, 'that I intende not to write any thing that is, or 'may be, contrary to the fayth of Christe, and al 'holy churche. But I am ready to revoke my say-'ing, if any thing haue passed my mouth for want 'of learning. And to submitte myselfe to correc-'cion, and my boke to reformacyon. And, as 'touching the poyntes of husbandrye, and of other 'articles conteyned in this present boke, I wil not 'say that it is the best way, and wil serve best in 'all places; but I saye, it is the best waye that 'ever I coulde prove by experyence, the whiche I 'haue bene a householder this XL years, and 'more. And haue assayed many and divers waies, 'and done my diligence to prove, by experience, 'which should be the best way.

'THE AUCTOR.

'Go, littel quere, and recommende me
'To all that thys treatyse shall se, here, or rede,
'Praying them therwith contented to be,
'And to amende it in places, where as is nede.
'Of eloquence they may perceyue I want the sede,
'And rethoryke in me doth not abounde.
'Wherefore I have sowen such sede as I found.'

If you think the above worthy a place in your intelligent publication, it is much at your service; and should you feel disposed to know, and to make known, a little more of the farming of our forefathers, I will, as I observed in the former part of my letter, give you a similar analysis of Barnaby Googe's book, which, though of a later date than the work before us, was printed 75 years previous to that of Blyth. I am, &c.

S. TAYLOR, jr.

Ditchingham, Norfolk, April 12, 1817.

BUCKWHEAT.

From the Complete Grazier, 5th London edition, 1830.

Buckwheat, (*Polygonum fagopirum*, L.,) vegetates with great luxuriance in dry, loose, and sandy soils, that are open to the effects of the sun; though the variety known by the name of Siberian buckwheat, which is much heavier and more palatable in the grain, will thrive in the poorest soil, and is not at all affected by cold. The best, and indeed the proper season far sowing it is towards the end of May, or the commencement of June; and, in the course of a week, it generally appears above the ground: the quantity is from one to three bushels per acre. Buckwheat requires little or no manure, and affords an excellent food, either for soiling or for winter store. Given to horses employed in slow draught, in conjunction with bran or chaff, whether the seeds be in a whole state or bruised in a mill, it will put them into fine condition; and, if given to cows, in a recent or green state, it greatly increases the quantity of milk. The seeds of the buckwheat, are excellent for fattening poultry and swine; but the last mentioned animals should, if possible, be kept from eating the whole vegetable, as it is asserted, not only to *intoxicate* them, but also to cover them with scabby eruptions. The peculiarly fine flavor of the poultry in the south of France is said to be derived from this grain; but its fattening properties are not equal to those of the corn in common use.

APHIS LANATA.

The *Aphis lanata*, nicknamed without reason the *American blight*, is a minute insect which is doing great injury to the apple orchards in Great Britain, and is extending itself in this country. In the June No. of the Gardener's Magazine, there is a collection of facts and prescriptions in relation to this pest, which it may be of use to notice.

"The blights wander wherever it pleases the wind to carry them; and if bad luck should drive one of them against the branch of an apple tree, there it will stick, creep into a crack in the bark, bring forth its young, and found a colony. It has just the look of a bit of cotton, or a downy seed. If you examine it, you will find it to be just like the plant-louse, which infests our rose trees, &c.; but unlike all other plant-lice, it is closed and muffled up with cotton wool, in such quantities, that at first you would have no more idea that the lump contained an insect, than that the mass of clothes on a stage-coach box in winter, contained a man. The white cotton soon appears in bunches; branch after branch becomes affected; the tree grows cankery, pines and dies," from the exhaustion of sap caused by these insects.

We have seen this aphis only upon nursery trees, and there they located themselves generally at the intersection of branches. Tubercles or knots soon appeared upon the bark where they had fixed, and on taking up the trees we often found they had extended their colonies to the roots, as indicated by strings of tubercles resembling the anbury in turnips. The remedy we employed for two seasons, which was a faithful application of oil, with a rag, to their nests, seems to have destroyed them, as well at the root as on the branches, as they have hardly met our eye for the two last years. The rains it is presumed, carried the antidote to the roots.

Various remedies for the evils the insects inflict are mentioned in the Gardener's Magazine. One writer recommends a mixture of whitewash and size, to be applied to the tree, warm, with a brush. Another, diluted sulphuric acid, three-quarters of an ounce measure of the sulphuric acid with seven and a half ounces of water, applied to all the crevices with a rag. This also destroys lichens, and other insects and their eggs. The sublimate of tar is recommended by a third, applied with a painter's brush; train oil by a fourth; oil and soot by a fifth; a strong infusion of tobacco by a sixth, &c, &c.

The best topical application which we have ever applied to the apple tree, whether to destroy insects or parasitical plants, or to impart health and vigor to the tree, is a very *strong* ley of ashes or potash. It destroys the bark louse and the larvæ of other insects, and gives to the bark a smoothness, elasticity, and freshness which no other application gives. We apply it the latter end of May, and have not repeated it oftener than once in three years.

B.

SEEDLINGS FROM GRAFTED AND UNGRAFTED FRUIT TREES.

An opinion prevails that seedling peaches, plums, &c. will yield fruit exactly resembling the parent, provided the old tree was not grafted,—and provided the *pits* be kept moist until planted,—to which some add, if the fruit be planted whole; that is, with an unbroken skin, and all the pulp left surrounding the stone.

As mankind are generally best satisfied with a reason for every thing, we will endeavor to inquire into the cause of such rules—the *why* and the *wherefore*—and begin by putting the question, *Why should the offspring of a grafted tree, standing on another's root, be more likely to prove a new variety than the offspring of a seedling tree standing on its own root?*

It has become a common opinion that new kinds of fruit originate from the pollen of one variety being carried by the bees or by the wind, to the stigma of another variety; and the offspring, partaking of the nature of both parents, must, in consequence, be a new variety. That this is very likely to happen amongst crowded trees of different kinds, will be readily admitted; and the experiments of *Knight* and *Van Mons*, tend to confirm it. But if a grafted tree stands too remote from other varieties to be affected in this way, the offspring could not change on this principle; and might not change at all. It will thus be seen that proximity to other trees, requires to be considered. Another question will then occur, *Are the stigmas of grafted trees more liable to be fertilized by other varieties, than the stigmas of ungrafted trees?* We could not affirm it. *How then can the offspring of a grafted tree be more liable to a change?* We know not; for whether the stock affects the graft by its sap, or not, it cannot affect it by the pollen when it produces none.

A fourth question is now presented, *Does an ungrafted tree produce seedlings exactly like itself?* Thirty years ago, when we had scarcely any other kind than the old Indian peach in the country, it was observed to come very *true* from the stone; and amongst the hundreds of trees produced in this way, we have not met with any distinguishable sub-variety. It has been the opinion of some horticulturists however, that inferior varieties are more permanent and less liable to change in their offspring than superior varieties,—as if the latter had ascended to the top of the wave with a strong tendency at the first change to fall back to the original level. We lay no great stress on this idea, though it may merit a passing notice. However, if in the beginning of things there was only one sort of peach, it follows of necessity, that it or its offspring must have spread into varieties unassisted; and we know from observation, that a plant, solitary, and remote from any other of its species, has in a few years passed into several varieties. *There are other causes then, besides the access of pollen to the stigmas, for such changes;* but in addition, when ungrafted trees grow in close assemblage with other kinds, it is very doubtful if the young trees will prove *true*. We have seen several kinds of peach trees crowded together in a small garden *without budding*, that varied much in their offspring. Among them was a white peach of very peculiar properties which could be readily traced in its descendants; but there were no two exactly alike.

It remains for us to speak of planting the stones in a recent state, while the whole or a part of the pulp remains attached. If we examine a peach stone in its freshest state, we find the pit a kernel no longer fast to the inside of the stone, but generally a little shrunk, and loose in its cavity. It is

already the embryo of a perfect plant; and if any moisture could transude from the pulp through the stone, which we incline to question, it is too late, if it ever possessed any power, to model the young plant; it could only at most be food, not needed; for the die is already cast; and the constitution of that plant, we fully believe, is not to be changed by any external application. We have now two seedling trees of a fine sort, from stones kept dry for more than a year in the garret,—the fruit of which is so nearly exact as to be scarcely distinguished apart; and we cite the instance as a further confirmation of the non-effect of drying, and of the unchangeable nature of an embryo.

In conclusion, we would advise those who wish to propagate varieties of fruit trees with exactness, to bud or graft,—assuring them there is no just ground for believing, so far as we can discover, that the descendant of an ungrafted tree has any better chance to be *true* than the descendant of a grafted tree. V.

ON THE FORMATION OF MORTAR.

From the Genesee Farmer.

Extract from an Essay of James Anderson, L.L.D.F.R.S.

"The best modern mortar I ever saw, was made of lime that I myself had analyzed, and found it contained eleven parts of sand to one of lime. To this there was added between twice and thrice its whole bulk of sand by *measure*, which may be allowed to have been, at least, three times its quantity by *weight*.

"Now, supposing that every particle of that lime had been so perfectly calcined as to be in a caustic state, there could not be less than forty-seven parts of sand to one of lime. The reader may allow what he pleases for the uncaustic part of the lime, and make his calculation accordingly. But it is hardly possible to suppose, that above one hundredth part of this mass, independent of the water, consisted of pure caustic calcareous earth.

"But whatever was the exact proportion of caustic lime, the mortar was made of these materials in the proportions expressed, and was employed for pinning the outside joints of the stone wall of a house situated in a tempestuous climate, and exposed to every blast. It is now about fourteen years since it was finished, and I do not believed there has fallen to the ground in all that time, one pound weight of the mortar.*

"Had this mortar been employed in building a thick wall, where it would have been suffered to dry slow enough, there seems to be little reason to doubt but it would in time have become as firm as the stones of the wall itself.

"From these considerations we may clearly see, that it is impossible to prescribe any determinate the proportion of sand to lime, as that must vary according to the nature of the lime, and other incidental circumstances which it would be tiresome to enumerate, and which would form an infinity of exceptions to any general rule.

"But it would seem, we might safely infer that the moderns in general rather err in giving too little sand, than in giving too much.

"It deserves, however, to be remarked, that the sand when naturally in the lime-stone, is more intimately blended with the lime than can possibly be ever effected by any mechanical operation—so that it would be in vain to hope to make good mortar artificially from pure lime with such a small proportion of caustic calcareous matter, as may sometimes be effected when the lime naturally contains a very small proportion of sand. But there seems to be no doubt that if a much larger proportion of sand were employed, and if that were more carefully blended and expeditiously worked than is common, the mortar would be much more perfect than usual in modern times.

"This I have tried experimentally with the desired success."

CUTTING CORN STALKS.

From the Genesee Farmer.

Much has been said and written on the subject of cutting up corn, and much diversity of opinion still prevails. Some prefer cutting above the ears soon after the kernel begins to change color: and any innovation on this practice is, by these, considered an indication of unskilfulness in husbandry. We believe this system is not only unphilosophical, but productive of much injury to the crop itself. Physiologists are well agreed, in this, that the leaves of plants are important organs, in the elaboration of nutritive matter, that by them the plant perspires, feels the influence of heat and light, and through them receives that which stimulates and promotes their vital operations. What then must be the injury which the plant sustains, when thus mutilated? The assimilation of the farina, which is the nutritious part of the grain, will be impeded and partially performed: consequently a less crop may be expected, not only in quantity, but the quality will be proportionately diminished. By topping early, the fodder is finer and sweeter, but does not afford so much nutriment, as when more fully matured. But by cutting the crop at the ground, the land is at once cleared from the stubble, in a measure, which when left long is always troublesome, by obstructing the progress of the plough, and is ready to be immediately applied to another crop. The weight of the grain is increased, and its value as an article of food is enhanced, because the grain is fully ripe. The quantity of fodder thus obtained, may not vary much from that by the other method, but more than double the quantity of manure will be secured, the value of which will be duly appreciated by every good farmer. We should be glad to receive some carefully instituted experiments on this subject for publication.

AMERICAN FARMER.

From the Baltimore Patriot.

We observe in the last number of the AMERICAN FARMER, that Mr. GIDEON B. SMITH has taken leave of that journal as its editor. Mr. S. has long labored with much zeal in promoting the cause of agriculture, and his useful and cultivated talents have often graced may of the publications of the day besides the Farmer. He deserves and we hope will find success, in whatever new undertaking he may have in view.

* In a note to a second edition of this work is the following addition: "After seven years longer trial, the mortar still proves good and firm, and exhibits no appearance of ever failing."

GATHERING AND SECURING POTATOES.

From the New England Farmer.

A variety of conflicting opinions have been, and we believe still are entertained, relative to the topic of digging and preserving potatoes. Formerly it was the custom among farmers to dig them early, while the tops were entirely green and the potatoes not ripe, nor indeed fully grown. They took care to dry them in the sun till the bulbs were almost as green as the balls or apples, and nearly as strong as so many quids of tobacco. Potatoes treated in this way become poison for pigs, and very unwholesome for all other animals including the great *rational* biped whose sagacity is as apt to go astray in this, as in other matters of importance to his welfare. It was probably this and other injudicious modes of cultivating, managing and using this crop, that caused those violent prejudices against the plant, which prevailed for a long time among the bulk of mankind, after the potatoe was first introduced and recommended as an article worthy of the attention of the rural economist. Even in this enlightened age and nation, we have known farmers nearly spoil their crop of potatoes by mismanagement in digging and securing them. Some of those wise cultivators who know too much to be taught, either by the lessons of experience or the dictates of reason, let them lay after they are dug, for several days, perhaps weeks, in the field, as if on purpose to spoil them.

But, of late years, more correct systems relative to this and other branches of husbandry are introduced and becoming prevalent. Men who unite science, good sense, and experience, afford such lights that none but those whose mental optics are, as it were, hermetically sealed by obstinacy and prejudice, persevere in the use of bad means to attain good ends. Among others who have deserved well of their country and of mankind, by illuminating the path of the husbandman, the Hon. Mr. Fiske, of Worcester, has directed his attention to the subject under consideration. The remarks to which we allude are contained in his address to the Worcester Agricultural Society, delivered October 3, 1833.

"While on the subject of the potato," says Mr. Fiske, "it may be worthy of remark, that it possesses one peculiarity distinct from any other germinating vegetable. It is not susceptible of vegetation until the season succeeding its growth.* From this it seems obvious, that nature has not accomplished its maturation at the period when the vines decay, and the farmer believes it to be ripe. It seems probable that the earth, by some unknown process, perfects its qualities after it has attained its growth. That potatoes which have remained the whole season in the earth are more farinaceous and pleasant, has been ascertained. A farmer in this town, who was in the practice of planting a large quantity, took his family supply from a large field early in autumn. As the residue were intended for his stock, he deferred harvesting them until a late and more convenient period. During their consumption, his table was furnished with some which had been destined for the barn. The quality was so obviously superior as to lead to an investigation of the cause. From that time the two parcels received an exchange of destination. Another fact illustrative of this position, was stated to me by an eminent farmer in the vicinity of Boston. A distinguished agriculturist, from Scotland, who had dined at the best tables in this city and its neighborhood, remarked at the hospitable board of my informant, that he had not seen in this country what, in Scotland, would be considered a good potatoe. He imputed their difference to the different mode of cultivation. There they plant early and dig late. Surely the science of agriculture must be in its infancy, when the cultivation of our most common and staple vegetables is in dispute!"

The following paper from the Transactions of the Society of Arts in London, may be of use to those who wish to preserve potatoes in the best possible condition, either for sea stores, foreign consumption, or domestic use.

"The usual mode at present practised for endeavoring to preserve potatoes, is to leave them, after digging, exposed to the sun and air until they are dry. This exposure generally causes them to have a bitter taste; and it may be remarked, that potatoes are never so sweet to the palate, as when cooked immediately after digging. I find that when potatoes are left in large heaps or pits in the ground, that a fermentation takes place which destroys the sweet flavor of the potatoes. In order to prevent that fermentation, and to preserve them from losing the original fine and pleasant flavor, my plan is, (and which experience proves to me to have the desired effect) to have them packed in casks as they are digging from the ground, and to have the casks, when the potatoes are piled in them, filled up with sand or earth, taken care that it is done as speedily as possible, and that all vacant places in the cask are filled up by the earth or sand; the cask thus packed, holds as many potatoes as it would were no earth or sand used in the packing; and as the vacant spaces in the cask of potatoes are filled, the air is totally excluded and cannot act on the potatoes, and consequently no fermentation can take place.

"I sailed from New-York to St. Bartholomews, and brought with me two hundred barrels of potatoes, packed in the above manner.

"On my arrival at this island I found, as I expected, that the potatoes had preserved all their original sweetness of flavor; in fact, were as good as when first dug, having undergone no fermentation, nor in the slightest degree affected by the bilge or close air of the ship. Some barrels of the potatoes I sold there, and at the neighboring islands, for four dollars per bushel, and at the same time potatoes carried out in bulk, without packing, and others that were brought there packed in casks which had not been filled up with earth, sold only for a dollar per bushel, they being injured in the passage by the bilged air and fermentation, being bitter and bad, whilst mine were as perfectly sweet and dry as when first dug. What remained I shipped from St. Bartholomews to Jamaica, where they arrived in equally good condition, and sold at a higher price than they had brought at the former islands; some of these casks of potatoes were put in a cool cellar by the purchaser at Jamaica, and on examining them when I was leaving the island, two months after, I found that they had in a very small

* This is not the case, where the continuation of warm weather is much longer than in New England. The early potatoes made in Eastern Virginia, when left in the ground until October, are sometimes materially injured by sprouting.—*Ed. Farmers' Register.*

degree sprouted but that all their original flavor was preserved. CHARLES WHITLOW."

In order to preserve potatoes in sand or soil, it is not necessary to pack them in casks or other vessels. They may be mixed with a due quantity of the earth of the field in which they have grown, and put into bins in cellars, or buried in holes dug in the ground. The earth should be in such quantity as to keep them from the air and from the general contact with each other. Placed in this manner, they will not suffer from the heat nor frost, if deposited in a cellar which freezes. If surrounded by earth they will receive little or no injury from frost. It is wrong to suppose that the earth or sand in which they are imbedded, should be perfectly dry. Some degree of moisture is necessary, in order to preserve the life of the root. If the vital or vegetative principle is destroyed, they will soon decay, by a sort of dry rot. They may, however, it is said, be cut into slices, and dried in an oven or kiln, and will then remain sweet and sound for years. We suppose that either the native juice of the potato should be expelled by heat, or the vegetative principle preserved by moisture, and a seclusion from the air.

THE USE AND VALUE OF DUTCH ASHES, AS A MANURE FOR CLOVER.

Extracted from Sir John Sinclair's *Agricultural state of the Netherlands.*

[The remarkable manure described in the following extract was referred to in the Abbe Mann's Observations on the Agriculture of the Netherlands, (which is one of the selections given in the second number of the Farmers' Register,) and it is so important a means of improvement, in that admirably cultivated country, that every one who wishes to know the features of Flemish husbandry, ought to be more particularly informed of the nature and composition of *Dutch ashes.* Our latest information with regard to the agriculture of Belgium, shows that an artificial compound manure has been invented by Mr. Hollert, formed of certain proportions of lime, clay, pit coal, salt, &c. which after being burnt, is considered similar in chemical composition, and equal in value, to the Dutch ashes. The sulphate and carbonate of lime, (gypsum and calcareous earth,) which are ingredients of the Dutch ashes, must constitute their principal value as manure. M. Hollert's scheme of a substitute, may be visionary: but nevertheless, it may be true, that cheap materials may be presented by nature, in this country as well as in Belgium, which may be so mixed, as to yield the same chemical results and proportions, and produce the like effects, as this valuable manure.]

"For a number of years past, the crops of clover in England have gradually become more and more deficient, and the crops of wheat sown after the clover, have frequently failed. It was supposed, that from too frequent repetition, the ground had become tired of clover, and that the same success in cultivating it could not be expected. The failure of the crop of wheat afterwards was peculiarly unfortunate, and certainly greatly contributed to the scarcities which have of late prevailed in this country. I was much gratified therefore to find, that in Flanders there were no complaints of the failure of the crop of clover, (except in one district, where a plant, called the orobanche, infested the ground,) and that the crop of wheat, after clover, was reckoned among the surest of any. It was still more satisfactory to ascertain, that the means of obtaining similar results, were distinctly known, were not expensive, and could easily be procured in England, being nothing but the application of Dutch ashes.

"According to the best information I have hitherto been able to obtain, there are two sorts of turf or peat in Holland. The first is found on rising grounds, and in a sandy soil, at from three to twelve feet from the surface, the strata varying from eighteen inches to three or four feet in depth. This sort is principally found in Friesland. It is cut and prepared in the same manner as the peat of Scotland and Ireland, burns quickly and cheerfully, gives a good heat, but leaves only a very light ash, of little value. The other sort of peat, which is more generally used in Holland, is extracted from the marshes, which are constantly covered, during the winter season, with water of a *brackish* nature; after this peat is reduced to a pulp, it is spread upon the ground, and when it has acquired a certain consistency, it is cut and dried in the same manner as the former. It burns less clear, and gives less heat than the other peat, but it lasts longer, and leaves a much heavier ash, full of saline matter, insomuch that it is sometimes used as a substitute for soda, in the manufacture of green glass. This can only be accounted for by the effects of the water by which it is covered, which not only deposits a muddy substance, whence the richer part of the ashes is derived, but the water being of a brackish quality, it impregnates the peat with salts.

"These ashes were analyzed about fifty years ago, when it appeared that from one-ninth to one-twelfth part consisted of glauber and marine salts.* In a recent analysis by Professor Brande, of the Royal Institution, the contents of the specimen given him were as follow:—

"Silicious earth	32
Sulphate of lime,	12
Sulphate and muriate of soda	6
Carbonate of lime	40
Oxide of iron	3
	93
Impurities and loss	7
	100

"In such an article, however, the variety of sub-

* See Memoires de 1, Acadamie de Bruxelles, Tome III. p. 47, where there is a paper written by the Abbe Marci, read on the 13th December, 1775, on the subject of artificial manures, and stating the advantage of using these Dutch ashes, as being then well known.

stances to be found in it must be very great, and in different proportions.

"In every part of the interior of Flanders these Dutch ashes are used for clover, and with a success hardly to be credited. They are brought to Brussels by a canal, and thence are conveyed, by *land carriage*, to the distance of from 50 to even 100 miles. Wherever they are used, there is no complaint of any deficiency either in the crop of clover, or of the wheat afterwards. Some instances of their success, it may be proper to specify.

"Mr. Mosselman, a great farmer at Chenoi, near Wavre, assured me, that without the ashes of Holland, he could neither have a crop of clover, nor of wheat afterwards; and that wheat, after clover *manured with Dutch ashes*, was the most certain crop of any.

"Mr. Hanelot, near Fleurus, declares, that he sows upon clover twenty-five cuvelles of Dutch ashes per hectare; (about nineteen bushels per English acre;) that no manure, though it were to be given in greater quantities, and at more expense, would equal it in strength; that after sowing these Dutch ashes, they always have two great crops of clover, besides pasturage afterwards; and that the next crop of wheat is not more injured by insects, than the other crops of that grain.

"Observing a great heap of dung in a field near Baulet, I inquired of Mr. Grossjean, the farmer who accompanied me, what it was intended for. He answered, that it belonged to another farmer, who thought to render the use of Dutch ashes unnecessary, by spreading a great quantity of dung on his young clover during the winter; and collecting it in the spring to carry to another field; but there was no comparison between the clover where the Dutch ashes had been applied, and the field that had been covered with the dung, the former being much forwarder, and in every respect superior.

"Mr. Vandoorslair, in the Pays de Waes, informs me, that this manure is used with great benefit where clover is kept for a second year, whether for cutting or pasture, and its advantage, where that practice is adopted, would be incalculable, as the second year's crop is of little value at present.

"It is unnecessary, however, to dwell more on individual opinions, when eighty-three practical farmers in the neighberhood of Fleurus, have joined in a public declaration to the following effect:—"All our farmers know by experience, that when clover is not manured at the rate of twenty-five cuvelles of Dutch ashes per bonnier, the following crop (of wheat) is very bad, notwithstanding any culture that can be given to the soil; whereas they always have an excellent crop of wheat after clover, and, doubtless, in proportion to the quantity of manure above mentioned being used." The farmers who have subscribed this declaration, must have been deeply impressed with the importance of these ashes; for, in general, they must have brought them from forty to fifty miles, by land carriage, from wharfs on the canal of Brussels.

"These circumstances astonished me more than any thing I had met with in the whole course of my excursion. The advantages of Dutch ashes have been long known on the continent; and though it would be as easy to import them into England or Scotland, as into Flanders, it does not appear to have been ever thought of, or tried; and on my return to England, on the 22nd of April last, the crops of clover in Kent seemed to me from a fortnight to three weeks behind, in regard to maturity, and greatly inferior in point of produce, to those I had seen on the continent; which, I am persuaded, was entirely owing to the use of these ashes.

"Upon inquiring into the price of these ashes at Brussels, I found it was one franc fifty centimes par hectolitre, (about 5*d.* sterling per bushel;) that it required 16 hectolitres (about 47 bushels) per hectare, containing rather less than three English acres. The quantity therefore is about eighteen or nineteen bushels per English acre, or from 7*s.* to 8*s.* besides the carriage.

"Mr. Ferrier, the British Consul at Rotterdam, (whose ready attention to my inquiries I acknowledge with much pleasure,) informs me, that the price at Rotterdam was seven stivers per 100 pounds, Dutch weight; and including all expenses, that it would come to about twelve stivers, which, at the present rate of exchange, is about 1*s.* 4*d.* per 100 pounds weight, delivered free on board. The freight per ton of 2240 pounds, would be about 2*l.* to London, and perhaps about 2*l.* 10*s.* to Leith. The expense, on the whole, would not probably exceed from 10*s.* to 15*s.* per acre, freight included.*

"Dutch ashes are used for various purposes, besides as a manure for clover. Some farmers spread them on the ground where they have sown turnips or carrots, passing a harrow over the surface, and thus destroyed the insects which injure those plants. These ashes are likewise sown on rye in October, on wheat and pasture lands as well as on clover in April, and on oats and beans in May. They are of great use to peas; but they render the grain harder, and more difficult to boil. In gardens they are used with much advantage, scattered over the surface, after the land is sown and raked. They are also good for hops, a handful being given to each heap. When applied to grain they promote its early growth, but are principally useful by increasing the quantity. They are in general sown by the hand, like grain; but care must be taken to leave no part of the surface without its just proportion. A still hazy morning is preferred for this operation, lest the wind should blow them away, and prevent their fixing on the soil and plants in the manner intended. The change which these ashes cause on the clover, is perceptible in the course of a week, and it is known, *from repeated experiments*, that without this precaution, vegetation has suffered so sensibly, that in some cases a crop of clover has been lost, and in others, has become less abundant. Among the other advantages of these ashes, it is said, that they not only bring with them the principles of fertility, but that they are also well calculated to hinder the multiplication of all sorts of worms and insects, (hence they may prevent the ravages of the turnip-fly or beetle,) to destroy the mossess and lichens, which injure our pasture lands, and to protect the wheat from several maladies to which it is exposed, in particular the nielle or mildew; and perhaps the exemption of Flanders in so great a degree from

* The expense would now be less than when the above was written. P. P.

these maladies, is partly owing to the abundant use of those ashes.*

"When completely analysed, perhaps we may be enabled to procure an artificial compound manure, equally efficacious; or it may be found that clay ashes, now so successfully employed by Mr. Craig of Cally, Mr. Boyd of Merton-hall, and other agriculturists in Wigtonshire, may in some respects, answer the same purposes.

"Mr. Young informs me, that whilst the crops of clover were abundant, the succeeding crops of wheat were equally good. If therefore, by the use of these ashes, our former crops of clover can be restored, a double advantage will be obtained. The saline substances in the ashes may also contribute to destroy the wire-worm, and in that way may protect the crops of wheat from injury.

"In a celebrated experiment made in France, wheat sown after a moderate crop of clover was indifferent; after fallow good, but after a great crop of clover that had been gypsumed, it was, in the language of the report, *superb*. The reasons are obvious. No insect can exist under so suffocating a crop as an abundant one of clover; and the roots of the clover, when abundant, furnish a great quantity of manure for the wheat. It ought to be a rule in farming, to sow oats after a moderate crop of clover, but wheat after a large one.

"I do not know any means by which so great an improvement can be so rapidly, and so generally introduced, and at so moderate an expense, as by the importation of Dutch ashes; and it gives me particular pleasure, that it is likely to promote, in a peculiar degree, the interests of the spirited and intelligent farmers of the county of Norfolk, to whom this species of manure is fortunately so accessible.

"In Switzerland, and other countries where these ashes cannot be had, they make use of gypsum, or the sulphate of lime; but from the best information I have been able to obtain, there is no comparison between the two articles, the Dutch ashes being greatly superior, and much more certain, the effects of gypsum being precarious."

ON THE FLEMISH SYSTEM OF MANURING.

From Sinclair's Agricultural State of the Netherlands.

"The Flemish farmers are peculiarly distinguished by their great attention to manure. It is a principle with them, that the fertility of the soil entirely depends on the riches you give it, and that a farmer cannot be too attentive to the collection and application of this source of wealth. The more opulent farmers likewise pave, and line with bricks, the receptacles for their dung, which is thus kept constantly plunged in a mass of liquid matter. The fibrous parts of the vegetables are in this way completely decomposed, and four tons of this manure go as far as five collected and kept with less precaution.†

"The following is a list of the manures made use of in the neighborhood of Lisle.

"1. The dung of cattle and horses, with the straw; 2. ashes; 3. lime; 4. the urine of animals, collected with care in brick cisterns; 5. the cakes of rape and hemp seed,* reduced to powder in a mill, and which is sometimes thrown into the urine cisterns. This last sort of manure, on account of its strength, is scattered about in small quantities, fifteen days before the seed is sown, that it may not prove injurious to the plant. 6. The sour water obtained by washing the tubs of starch-makers. This is considered to be a very weak manure. 7. The urine of cattle fattened at the distilleries; 8. the dung of pigeons; 9. that of sheep, gathered by young children along the sides of the roads; 10. street dung; 11. marl; 12. the refuse of horns, a manure as effectual the second as the first year; 13. night-soil purshased from scavengers. The price of this article is three-pence, to the scavengers, per ton and twice as much to the inhabitants of the country. A wagon-load of this matter, drawn by three horses, costs only twelve francs, or 10*s*. sterling. The town of Lisle, however, alone produces as much of this sort of manure, as would sell for about 4200*l*. a-year. The night-soil of an hospital there, containing 1800 souls, is let for 3300 francs, or 137*l*. 10*s*. per annum.

"In order to increase the quantity of manure, not only horses, but cattle, and even sheep, are kept in stables during almost the whole year; and, that nothing may be lost, the stables and cow houses are washed with water, which is conveyed into cisterns, or thrown into the dunghill.

"Great attention is also paid to cover the dung. When it is spread on the surface of a field to be ploughed, after a furrow is made, a person with a fork or rake goes before the plough, and throws from the surface, into the furrow, the manure upon as much soil as the plough is likely to turn over, which is thus effectually covered, and prevented from being exposed to the atmosphere. This should be done *in all cases*, and not restricted to the potato crop, as in this country.

"The Baron de Serret has ascertained, that powdered rape-cake strewed over the surface of the ground, destroys la taupe grillon (gryllo talpa,) so injurious to kitchen-gardens; and he is persuaded that every insect of the same species may be destroyed by the same means.†

"But the great improvement that has taken place, in regard to manure, is, its being applied in a liquid state. For that purpose, the urine of cattle and horses is regularly collected into cisterns, that none of it may be lost. Mr. Mondez has five cisterns at Frasnes, fit to contain 230 metres (about 250 English yards in capacity,) for receiving the urine of 68 cattle, of different ages, and 32 horses, young and old. This quantity of urine

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* It appears by the analysis of the turf, (whence the Dutch ashes are derived,) by the Abbe Marci, that the salts are found in the bituminous parts of the peat; and fortunately great quantities of peat, full of bitumen, are to be found in the Hebrides.

† Communications to the Board of Agriculture, Vol. I. p. 238.

*Cakes of flax-seed are destined for feeding cattle and sheep.

† "The use of oil in vegetation also, is very great. When the cuttings of gooseberries are planted, it should be done in a lump of clay mixed with cow-dung, and a few drops of train oil; and when young thorns are planted in a poor or sandy soil, they will thrive better, if their roots are dipped in oil. Near the first turnpike going to Mile-End, there is an artificial manure sold, supposed to be the sweepings of the dry-salters in Thames-street, mixed with the refuse of those places where the blubber of whales is boiled; one bushel of which, it is said, is equal to twenty-eight of common manure."

manures 16 French hectares, or about 40 English acres. Many other farmers adopt the same system.

"It is proper to state, that several intelligent practical farmers object to this plan; alleging, that the dung of the farm-yard loses as much as is gained by the cistern system. But those who were appointed to examine Mr. Mondez's practice declare, that owing to the judicious concavity of the farm-yard, there was as much moisture as was necessary to ferment the straw, which may be effected by water alone, and repeated turnings, as gardeners know well; and it is now ascertained, by the experience of the Swiss, that liquid manure is the most efficacious of any, and produces a third more effect than what is spread on the surface. Hence, after the dung is fermented, they dilute it in water, and the liquid alone is carried to the field, and scatered over it. The earth immediately imbibes the liquid, which soon reaches the roots of the plants, and causes a rapid vegetation; whereas it is a long time before dung in a solid state fertilizes the soil. The straw that remains after the dung is thus washed, is applied as manure for potatoes.

"The experience of Mr. Harley, who keeps a great dairy near Glasgow, corroborates this doctrine. He says, 'That the advantages of irrigating grass lands with cows' urine, almost exceeds belief. Last season some small fields were cut six times, averaging fifteen inches in length at each cutting, and the sward very thick. The soapsuds of a neighboring wash-house are applied to the same purpose, with considerable advantage.'

"The great argument for separating the urine from the dung is that it is always at the command of the farmer, and can be applied in any manner he thinks most advantageous. It is peculiarly useful in spring, when the application of liquid manure gives a new fillip to the plant, and makes its growth more vigorous. The urine is much improved by powdered rape-cakes, which are frequently thrown into the cisterns."

CULTURE OF SILK.

From the Genesee Farmer.

Marcellus, Sept. 10th, 1833.

MR. L. TUCKER,—I send herewith, for publication in the Genesee Farmer, a copy of a letter, lately written by myself to a friend of mine, in the county of Oneida. The subject of it is the culture of silk, with reference to its general introduction in this section of the country. As I have, not unfrequently, addressed the readers of the Farmer on the same subject, I am aware, they may accuse me of bringing it too often to their consideration. My apology, if apology be needed, is, that I consider this as a subject of deep interest to the community. The silk-growing business is already commenced, by many praise-worthy citizens in Western New-York: it *must*, and I am sure, it *will*, go on. Yet, in the present stage of its existence, while no profits are realized, and its advantages are seen only at a distance, and perhaps through a false glass, it is necessary, in order to keep up the excitement, that the bellows be kept constantly blowing. At the bellows, therefore, I take my station, and *there* I hope to stand, until the object is secured.

When once Mulberry foliage shall have become plenty in the country, and the business of silk-making, shall have assumed the attitude which belongs to it, there will be no farther need of individual exertion to keep it in motion, and accelerate its progress. The business will then recommend itself; and, as the fire will burn spontaneously, there will be no need of continuing the use of the bellows.

DAN BRADLEY.

Copy of a letter to SAMUEL ROYCE ESQ. *of Clinton Village, in the county of Oneida, on the Culture of Silk, and its application to this country.*

MARCELLUS, September 9, 1833.

DEAR SIR—Since I left your hospitable mansion, into which, while a sick man, it was recently my good fortune to be cast, I reflected on the conversation that passed between us, relative to the culture of silk, and its adaptation to the circumstances and condition of your family. It appears to me that the subject, in relation only to your own interest, merits greater attention than we then gave to it.

For several years, I have had the culture of silk, with reference to its general introduction in the United States, and especially in this section of the country, under my own special consideration, and have given great attention to the subject. Of course, I have kept myself in the constant pursuit of such information as might give me light in relation to this subject. My success in this has been less than I hoped it would be; yet I flatter myself, that I have acquired some knowledge of the silk business, that may be useful to my fellow citizens, and to yourself, and your family in particular. So far as relates to nurturing silk-worms, and converting their produce into merchantable commodities, I yet lack the best of all knowledge, that is, such as is derived from practical experience. But, sir, such knowledge as I have, it will give me great pleasure to impart to you, if it can do you any good, or afford you any satisfaction.

In the first place, permit me to say, the question is settled beyond all dispute, that silk may be produced in the United States, and in Western New-York particularly, to as great advantage as in any part of the world. That vast quantities of it are produced *somewhere*, we all know: and we know too that the annual consumption of this article in the United States alone; amounts in value to little or nothing less than eight millions of dollars. We are informed, by unquestionable authorities, that, in whatever parts of the world the silk growing business prevails, it is there considered one of the most productive occupations, yielding to industry a greater reward than almost any thing else.

As my subject is vast, I must pass over it with all practicable brevity. It need not be considered, that there is any obstacle in the way of making silk to great profit, in the village of Clinton, or any where else, within the bounds of our happy country. If, as is known to be the fact, it is a profitable business in other countries, no reason can be seen why it may not be equally so in this. In regard to the expediency of introducing it at your own premises, permit me to say, I scarcely know of another private situation, at which it could be introduced, under circumstances so felicitous. I need not assign my reasons for thinking so. The most of them will readily occur to your own mind.

I will, therefore, say only that, so far as relates to house-room, for the accommodation of silk-worms, you are already happily prepared for carrying on the silk-making business, on a large scale. We have information, derived from experience, and entitled to full credence, that a room, eighty feet by forty, will be sufficient to accommodate a million of worms. The large building which you occupy, including the numerous apartments of its lower and upper stories, will afford that amount of space, and much more. A portion of it, sufficient to accommodate a million of worms, or more, can be spared for that use, during the short time that worms operate, and yet the family, although it may be numerous, experience no serious inconvenience.

At a moderate and safe calculation, 3,000 worms will produce a pound of reeled silk; of course, a million will produce 333⅓ pounds. The value of this, at $5 a pound, (the lowest estimated value) will be $1666 66/100. But we are told that, if silk is well reeled, as it always may be, with proper care and attention, it is now worth, in the American markets, from seven to ten dollars a pound. The amount of labor, requisite, for taking care of a million of worms, every thing included, is estimated as follows: for the first week two persons; for the second week four; for the third eight; and the remainder of the time, which may be ten days, or more, from sixteen to twenty. The most of these laborers may be boys and girls, women, and aged and decrepit people. It will always be easy to hire enough of such laborers, and at trifling wages. You will reflect, dear sir, that *here* there is no expense of carts, wagons, ploughs, harrows, harnesses, oxen, horses, &c. And surely, there will be no necessity of employing *whiskey* as an agent, in carrying on this business.

The quantity of land necessary, to be employed for the growth of Mulberry trees, will not be great. Gideon B. Smith, Esq. of Baltimore, who has been taught by experience, tells us, that a full grown Mulberry tree will produce foliage enough to feed 5000 worms. If then a million are to be fed, the number of full grown trees, must be two hundred. But the same gentleman remarks that, in order to guard against failures, and losses of leaves which may happen after they are picked, and also to save the trees from excessive cropping, it is better to have double the number of trees, that is, two trees for every 5000 worms.

If it be intended, that Mulberry trees shall attain to all the growth of which they are susceptible, it will, doubtless, be necessary to set them at a great distance from each other, as apple trees are usually set in orchards, perhaps greater. This we know, is practised in many places, and it may be the better way; yet, it is not the way that I should recommend to planters, in this section of the country. I think it better to incumber no more ground with Mulberry trees, than will be necessary for the intended purposes. If set in a form much more dense than that of apple orchards, they will grow, for several years, to perfect advantage, and, in the mean time, produce as much foliage, as if set in any other form. Subsequently, if it be desired to give room to some of them for greater extensions, they may be thinned. I have advised many of my fellow citizens, who have sought to me for advice, to set Mulberry trees, if intended for standards, at the distance of ten or twelve feet apart. I know not *now* how to give better advice. You will see, my plan is, to have the Mulberry trees, after a year or two, exclusively occupy the ground. At first, for one or two seasons, potatoes, or other crops, may grow among them. Subsequently, tillage should cease, and nothing be required of the soil, but the produce of Mulberry foliage.

There is another manner of setting Mulberry trees, which is much recommended: that is, to set them in hedges, or otherwise in a form so dense, as to give at the rate of 3000 trees, or nearly that number, to an acre. Persons, commencing Mulberry plantations, will do well to occupy a portion of the ground allotted to that use, with trees planted in this manner. The produce of such plantations, is said to be very great. I have little doubt of the fact, that an acre of good soil, planted with Mulberry trees, three fourths of it at ten or twelve feet distances, the remainder in hedges, or otherwise in a dense form, will, after the trees have been set five or six years, and well taken care of, produce foliage enough to support a million of worms. Some writers say, an acre may supply "two millions." I dare not put the estimate so high. It is enough to say, one million. There are very few farms in the country, whose produce, in the ordinary way of farming, exceeds in value, that of *one* such acre. If such be the facts, how great are the inducements to engage in the silk business? Surely, many thousand of our industrious citizens, should hasten to embark in an enterprise, so full of promise.

Although I am perfectly sincere in making these remarks, yet there are in society many individuals, whom I could not advise to meddle at all with the silk business. For instance, if the man be a lover of ease, and given to indolence; if he be careless and slack in his manner of conducting business; if his faith be weak, so that he cannot labor with a view to objects unseen, and placed at some distance; or if he lack courage to encounter difficulties and disappointments, and be hasty to relinquish pursuits, if not attended with immediate success, he should, by no means, be advised to undertake the culture of silk. If he do, it is certain, he will not succeed in it. It scarcely need be said, he will succeed little or no better, in any thing else.

Think not, respected sir, that I harbor the slightest suspicion, that either of these characteristics belong to you, or any of your household. I know better. Yet for the benefit of others who may hear, I have said these things; and I say farther, that it will avail nothing to plant Mulberry trees, unless the ground on which they are to grow, be well fenced, and secured, especially while the trees are small, against the intrusion of cattle, horses, sheep, &c. The trees too, while young, will require some cultivation to render them thrifty, and rapid in their growth.

There can be no doubt, that the growth and manufacture of silk, will, in a short time, become general in this country, and that silk factories will abound among us, as those of cotton and wool do now. This new branch of industry will add much to the resources of the country, and become the happy means of improving the condition of many thousands of our citizens. All such farmers, as are too limited in their means of subsistence, may easily improve their condition, by cultivating Mulberry plantations, and causing their foliage to be converted into silk. This may be done, without inter-

fering, in the least, with the ordinary resources of their farms. And let it be considered that, as a gentleman of the south has recently remarked, "Silk always was, is now, and always will be a cash article."

The families of many poor widows and orphan children, might be relieved from the sufferings of poverty, if they could have employment, in the simple, easy, and healthy business of making silk. Ought not farmers, who have land enough to be spared for the growth of Mulberry trees, to consider this, and plant freely, that the poor of the land may have the means of profitable employment?

We are informed that in one of the eastern states, a young lady not long since, took a Mulberry plantation to be managed by herself on shares, and that, at the expense only of her own labor six or seven weeks, she realised to herself $108, rendering the like sum to the owner. This was done by an exchange of work, so that when her pressure came on, she had help enough provided and paid for. Is not this simple tale, the truth of which, I suppose, is not to be questioned, full of instruction to the farmers of this country? How much good they might do, by multiplying Mulberry plantations! Let them destroy half the apple trees, which now grow to no useful purpose, in their orchards, and supply their places with Mulberry trees.

The culture of silk will apply, with peculiar felicity, to such families as contain many children. A southern planter of experience in the business of silk-making, in a late communication on the subject, remarks that "for every child of a family, aged from twelve to thirteen years, and employed a few weeks only, in gathering leaves, and taking care of silk-worms, $300 may be realized." If so how many families that are now poor, might become affluent.

If manual labor, in any form, can be successfully connected with seminaries and schools of learning, it appears to me, the culture of silk, including the reeling process, and perhaps, some other branches of its manufacture, offers a business the best of all adapted to such purposes. No other can be thought of, so happily suited to the strength, capacities, and amusements of pupils in such institutions. There is no other, in which they can be employed to equal advantage. This business is adapted to both sexes alike; and it may be so planned as to afford a pleasant and profitable employment for the pupils, during the whole year.

To all public houses of pauperism also, the culture of silk is most happily adapted. Such institutions, of which there are many in this state, might, in a short time, support themselves, and perhaps do more, if this branch of industry were properly introduced, and prosecuted with courage and ability. It is, beyond dispute, the indispensable duty of all superintendents of county poor houses, to institute without delay, Mulberry plantations for their use.

Capitalists need not the profits that may be derived from the growth and manufacture of silk; neither, at present, is their capital needed for that use. Hereafter, it may be otherwise. It is a peculiar excellence of the business which forms the subject of this discourse, that it requires very little capital to gain access to it. To families of moderate fortunes, and especially those whose means of support are too limited, this business offers relief; and thousands there are, who should bid it a hearty welcome.

I have, dear sir, already gone far beyond the bounds which I had prescribed to myself when I commenced writing; and certain it is, I have taxed my feeble strength too severely. And yet, I have arrived only at the middle of my subject. I find myself compelled to pass over many interesting considerations which I intended to introduce.

It has been supposed that there was something quite mystical in the silk making business, and that it required more than ordinary ingenuity to become capable of managing its complicated details. We are now assured that it is not so; that the business, in most of its details, is remarkably simple and easy; that even the art of reeling, which has been supposed very difficult, is easily attained, and may be practiced, with perfect success, in any of our families. We are informed, that reels, after the models of those used in Europe, have been constructed and improved, by our own artists, and are now for sale in this country at the low price of $12. Indeed, we are informed, that a gentleman of the name of Brooks, a citizen of Massachusetts, has recently invented a reel for silk, on a plan entirely new; that this reel is found to possess much greater excellence than any ever used in Europe, and is happily adapted to the use of private families. You see every thing conspires to encourage the Mulberry planter, and the silk grower.

You will permit me, sir, in closing this letter, to reiterate my advice to you and your household, to introduce the reading of the Genesee Farmer. This paper is abroad, in nearly all the land, and doing an immense deal of good. I have not been informed, however, that it circulates in the county of Oneida. Sure I am, that every Mulberry planter, every practical husbandman, and every horticulturist, who will read it attentively, will derive from it a tenfold remuneration of its cost. It is printed at Rochester, and published by L. Tucker & Co. proprietors. Judge Buel conducts its editorial department. With great respect,

Yours, &c.

DAN BRADLEY.

Samuel Boyce, Esq,

TO DESTROY ANTS.

From the Horticultural Register.

Having read in pages 278 and 279, two complaints against ants, I am induced to send you the following: Some time ago, a drawer in which I kept sugar was so much infested with ants, that we were obliged to remove the sugar from it. It happened from some cause or other, a small piece of camphor was laid in the drawer, and on opening it a few days afterwards, we were agreeably surprised to find the bottom litterally covered with dead ants. This induced us to repeat the experiment, and from that time we have found no difficulty in keeping the sugar free from their depredations, by allowing a small piece of camphor to be in one corner of the drawer. Where trees upon walls, or plants are infested, I should recommend small pieces of camphor to be thrown on the ground round their stems, and in some cases, to dissolve a little in alcohol, and sprinkle it over the leaves in a diluted state with a common syringe.

JOHN J. GODFREY.

Albany, March 3, 1832.

INQUIRY.

From the Lynchburg Virginian.

What has become of the Weevil?

About twenty year past, the black weevil were very numerous; they decreased gradually, and I have not seen one for eight or ten years. The white weevil have likewise been numerous till last year, when none appeared; neither are any to be seen this year. There is another kind of weevil which I have known to do considerable damage; they are about one third the size of the white weevil, of dark color, slender, and have feelers like a wasp; these have likewise disappeared for several years.

I have not this year seen a single Tobacco Fly.

It is requested that inquiry be made throughout the United States, through means of the newspapers, whether or not these insects are yet to be found in our land; and if so, where? From an inquiry and investigation of this subject, benefit may arise other than that of gratifying curiosity.

Amherst, Va. October 1833.

STEAMBOILER.

Extract from The Farmers' Assistant—by *John Nicholson, Esq.*

This is an implement that no Farmer or Planter should be without, as potatoes, particularly, are nearly doubled in value, for feeding and fattening when boiled. Turnips and other roots, and pumpkins, are also much improved, as food for cattle, by a similar process.

Boiled clover-hay is found very good for keeping swine, during winter; and we are of opinion that if milch cows were fed on it, during that season, it would greatly improve the quantity of their milk, and keep them in better order, than when fed dry to them. We believe this to be well worthy of a fair experiment, by having a vat, or box, to hold the hay, sufficiently large for the purpose.

A steamboiler is commonly made by setting a kettle holding twelve gallons or more, in a furnace, of brick or stone, and over this a hogshead, with one head taken out, and the other bored full of holes, is set so close that the steam of the kettle, when boiling, can only rise through the holes, and thence ascend among the articles to be boiled in the hogshead, and pass off at the top. In this way a hogshead full of potatoes will be nearly as soon boiled, as a small part of them only could have been, if placed in the kettle underneath.

As the kettle must be so closed as to prevent any steam passing off, but through the bottom of the hogshead or vat, a pipe or tube must be set in one side, through which with the aid of a funnel, the water is to be poured into the kettle, as often as occasion may require. When poured in, the tube is to be stopped, with a plug prepared for the purpose.

Grain of all kinds may be steamboiled to great advantage, for feeding and fattening cattle; but, in that case, it is requisite to have the bottom of the hogshead covered with a cloth, to prevent the grain running down through the holes.

By experiments which have been accurately made, in Pennsylvania, upon Indian corn and potatoes, used for fatting swine, it was found that they increased in weight one third faster on the boiled, than on the unboiled food; or in other words, they gained three pounds when fed on the former, where they only gained two pounds when fed on the latter. We are fully of opinion, that steamboiling food, for feeding all sorts of cattle, generally increases the value of the food, as much as forty or fifty per cent.

We are induced to lay this down as a general rule, that all kinds of food, whether for man or beast, is more or less improved on its nutrimental qualities, by being boiled. This is evidently the case, in regard either to grain or roots; and we believe that every kind of vegetable matter, even green grass itself, will be found much improved as a food for cattle, when it has been sufficiently subjected to the operation of the steamboiler. But, whether the additional expense thus incurred, would, in all cases, be found overbalanced by the additional value thus given to the food, must depend on the result of experiments to be fairly and properly made.

TRANSPLANTING TREES.

From the New England Farmer.

Mr. Fessenden:—Much difference of opinion has existed, as to the advantages of spring and fall planting of trees, &c. Spring being the season when our feelings are the most awakened to pleasurable sensations, and when we take the most satisfaction in making our rural improvements, it has, from that circumstance, probably arisen, that it is generally selected as the season for transplanting trees.

Experience however has proved, that plantations formed in autumn, are far the most successful; and in all climates where the excessive cold, or the delicacy of the trees are not insurmountable objections, the *fall planting* is to be preferred. It allows a sufficient period for the ground to become settled and compact about the roots; and the latter become prepared, during the same space of time, to throw out the small fibrous roots whose vegetation commences at the first return of spring, uninterrupted by any retardment which a spring removal is calculated to produce. Their growth, in such case, seems unaffected by the transition; and the settled state of the earth, which allows the young roots to extend themselves promptly, forms a powerful protection against the effects of drought, whereas, when they are removed in the spring, the looseness of the earth, for a considerable period, retards the advance of vegetation, and renders them liable to much injury; thereby causing many trees entirely to fail, unless they are nourished by frequent waterings. Cherry trees, of which a large proportion perish in the spring, are generally transplanted with success in the autumn; but notwithstanding my father has for more than thirty years, stated these facts in public communications, still many omit to pursue the course advised, and great annual losses result to the public.

With regard, however, to those fruits that have been originally brought from warmer climates, such as the peach, apricot, nectarine, and almond, which are natives of Persia, Armenia, &c.—it is necessary for us to consult the operations of climate also; and from a consideration of the attendant circumstances, I have come to the following conclusion:—In localities south of New York, the fall is preferable for transplanting *all trees*: north

of New York, the fall is preferable only for the apple, pear, plum, cherry, quince, and all other trees of northern latitudes; whereas, the spring is to be preferred for the peach, apricot, nectarine, and almond, which, for the reasons before stated, might, during severe winters, suffer from the intensity of the frosts. Still, I do not mean to assert, that trees of these kinds are *certain* to be injured by the winter; as, in very many seasons, they are not in the least affected: but they are exposed to vicissitudes which may or may not occur. Many gentlemen, however, of excellent judgment, make their plantations in the fall, even of the more delicate fruit trees; which only serves to prove, that even in the most intelligent minds a diversity of opinions exists.

Very respectfully.

WM. R. PRINCE.

GATHERING APPLES.

From the Genesee Farmer.

Apples for late keeping should be gathered before over ripe, and before the hard frosts of autumn. They should be hand picked, and if the quality is such as to allow it, they should be spread upon floors or straw, and not allowed to lie more than two or three deep. Some require to be gathered sooner than others. The apple known in this section by the name of *Pound Sweeting*, should be gathered as early as the last week in September, otherwise they will become "water cored" as it is called. If gathered early this will be prevented, and they may be kept until February or March, and will be found excellent for the table, and for baking, we do not know of an apple equal to them. If apples can be so exposed as to become a little shrivelled before they are put in the cellar, they will keep the better for it. When put in the cellar, they should not be allowed to lie too thick. Apple bins should be so arranged, that floors can be laid one above another, at a distance of about two feet. The floors should be laid with narrow boards, and the cracks left at least two inches wide, to allow the air to pass through the apples freely, which will carry off the moisture produced by evaporation. Those who would carry apples, pears, quinces, or peaches to market, should pack them in chaff, or fine grass of second growth, a layer of fruit and a layer of grass. In this manner fruit may be delivered fresh and sound, and one bushel of fruit free from bruises is worth more than three that are brought in casks or boxes in the common way.

CLOVER MACHINES.

From the Genesee Farmer.

Farmers who have thrashing machines in operation at their barns may with a little expense, put a clover mill in operation by the same horse power. A cylinder of the same length as the one used for thrashing grain, covered with sheet iron, punched full of holes like a grater, revolving within a concave of the same description, will answer all the purpose of a more expensive machine. By passing the clover chaff after it has been thrashed from the straw, through this machine, the chaff is ground fine and may be separated from the seed by the common fanning mill.

REMARKABLE COLLECTION OF SHELLS IN NEW JERSEY.

From Finch's Travels in the United States.

In the northern counties of New Jersey are numerous marl pits, formed by the decay and dissolution of fresh water shells. Some are of great extent. A very singular one in the vicinity of Marksborough is called the Snow Pond. I. Thompson, Esq. politely went with me to view it. When seen at a distance, it appeared as if the ground was covered with drifts of snow, although it was in the month of August. On arriving at the spot, I found it was caused by innumerable small white shells, which formed a border to a pond three miles in circumference. The shells extended in many parts a hundred yards from the shore, and a cove which extended a mile was completely filled with them. Towards the centre of the pond the bank of shells declined suddenly to an unknown depth; many attempts had been made to fathom it, but without success. The shells are extremely minute, none of them more than three lines in diameter, and many one third of that size. They appear like grains of sand. The quantity amounts to many thousand tons. Recent shell fish of the same kind are no doubt living in the centre of the pond, but have not hitherto been noticed on the surface. No use is made of this immense deposite of shells, although a very pure corbonate of lime. A small dam thrown across one end of the pond was said to have been made by the beavers.

TO PRESERVE GRAPES.

From the Genesee Farmer.

Where there are several bunches in one branch, it may be cut off, leaving about six inches in length, or more, of the wood, according to the distance between the bunches, and a little on the outside of the fruit at each end; seal both ends with common bottle wax, then hang them across a line in a dry room, taking care to clip out with a pair of scissors any of the berries that begin to decay or become mouldy, which, if left, would taint the others. In this way grapes may be kept till February; but if cut before the bunches are too ripe, they may be kept much longer.

Grapes may be kept by packing them in jars (every bunch being first wrapped up in soft paper) and covering every layer with bran, well dried, laying a little of it in the bottom of the jar; then a layer of grapes, and so on, a layer of bran and grapes alternately, till the jar is filled; then shake it gently, and fill it to the top, with a bladder tied firmly on to exclude the air; then put on the top or cover of the jar, observing that it fits close. These jars should be kept in a room where a fire can be kept in wet damp weather.

FAMILY STEAMER.

From the Wilmington Press.

There has been introduced into this place, a little apparatus, admirably adapted to destroy noxious vermin, and to prevent their increase. It is a portable steam generator, and is very easy of application; the smallest crack or fissure is thoroughly searched, and not a bug or insect can escape destruction. It is an article which every tidy housewife ought to possess.

GREAT CROPS OF WHEAT IN NEW YORK.

From the Genesee Farmer.

Mr. Goodsell:—I have seen several statements of large crops of wheat from different parts of the country published in agricultural papers, but as yet, few such have been furnished from this, which we consider one of the best wheat growing towns* in this county.

On the 29th of July I forwarded to you the number of sheaves which I had harvested from one bushel sowing red chaff wheat. As I have thrashed them, I now send you the quantity which they produced, viz: sixty-seven bushels. To say the quality was fine, would be superfluous.

Mr. C. Hall had a piece of twelve acres which gave fifty-four bushels per acre. Mr. Hall's was the red chaff wheat.

Another nieghbor of mine sowed two bushels of the Beaver dam wheat, from which he harvested and cleaned one hundred and sixty bushels.

RAWSON HARMON.

Wheatland, Sept. 21st, 1833.

PLANTING VINES IN YARDS.

From the New York Farmer.

Every person who occupies a house, either in the city or country, should consider himself under obligations to plant a vine in his yard. Suppose a choice variety of either foreign or native grapes should be planted in every yard in this city, in a few years, not a family, however poor, would be without this delicious fruit. The expense would not exceed from 25 to 50 cents. Many would undoubtedly be neglected, and die; but many, also, would grow and bear fruit abundantly. Let it not be an objection, that the tenant is to occupy but one year.

For the Farmers' Register.

COMMERCIAL REPORT.

October 30, 1833.

Some important changes in commercial affairs have occurred during this month. The withdrawal of the public funds from the United States' Bank, and the substitution of various State Banks as agents for the goverment, has caused money to be less abundant, and has somewhat lessened the facility of transmitting funds from one part of the country to another. As yet this is felt chiefly in the southern commercial towns, where the cotton crop is coming to market, and where money is rendered scarce by the difficulty of negotiating bills on the northern cities.

The price of *tobacco* has advanced considerably, in consequence of the crop of last year proving smaller than usual. The exports of the United States are not yet ascertained, but it is known that the western crop was several thousand hogsheads less than the previous one; that of Maryland not large, and the result of the inspections in Virginia is thus: for the year ending 1st October, 1833, 18,000 hhds. passed, 12,400 hhds. refused; in 1832, 20,700 hhds. passed; 15,800 hhds. refused. The export from Virginia to foreign ports in 1833, was 20.150—in 1832, 27.000—in 1831, 24,000—in 1830, 31,000—and in 1829, 29,000 hhds.

The quantity shipped coastwise and manufactured is not correctly ascertained.

It may be questioned whether, on a broad scale, the interest of the planter suffers by the crop proving small. The additional price obtained for a short crop, generally makes it amount to as much money as a large one, for no more than a certain quantity can be consumed, and a diminished supply serves to clear the markets of an useless surplus, which would hang heavy and keep the price down or if sold would produce very little money, and merely change owners, without being consumed. The price of tobacco during the ensuing season will doubtless be high. At present it commands from $5 for very inferior, up to $10 and more for good—fancy qualities connot be quoted.

A new and unexpected competitor has appeared in the grain market—which, thanks to the British Corn Laws, has seriously affected ours. From the port of Archangel, in the north of Russia, large shipments of wheat have been made to Canada, there to be ground into flour, and re-exported to Great Britain or to her possessions, where it is admitted for consumption at a low rate of duty, while the same grain cannot be imported and ground in England without paying a duty which amounts to prohibition. It is well known that a considerable portion of the flour made in the western part of New York and the northeastern part of Ohio is sent directly to Montreal, whence it can be exported to the British possessions on the payment of a small duty; while the same article will not bear exportation to the same markets, from the ports of the United States—thus giving the profits of agency and the carrying trade to British merchants and British ships.

It is greatly to be desired by the growers in this country, and by the consumers in their own, that the reformed parliament may make some revision of the British Corn Laws, which bear more heavily at home than on foreign countries, inasmuch as the consumer can less afford to pay a high price for bread, than the producer to accept a low one.

Speculation, which when once excited, seldom knows where to stop, had advanced the price of cotton in Europe and in this country, to very high rates.

The expectation of immediately realizing large profits on their speculation, induced persons in Liverpool and Havre who were entirely ignorant of the trade, to make investments, with the intention of selling out in a week or two; but when the first rumor was circulated of the prospect of a large and early crop in this country, their fears were excited, and their purchases forced on the market—which though scarcely supplied, bore such high prices as to deter manufacturers from buying largely. A panic was then created, and its effects will scarcely be removed before supplies of the new crop will appear, and a continued decline in price may be apprehended, until the extent of our crop shall be ascertained, and a considerable portion of it be at market. The crop will doubtless prove large, and the quality good. The price can scarcely decline so low, as not to remunerate the planter handsome-

*It may not be superfluous to state to many Southern readers, that the word "*town*," is used in the Northern States, for a section of *country* of certain limits—and not according to our application of the term, or to the proper signification, which differs from both.—*Ed. Farmers' Register*.

ly. The quantity produced and received in Virginia for the year ending 1st October, is about 34,000 bales.

The crop of the United States made in 1832, was 1,070,000 bales—in 1831, 987,000—in 1830, 1,039,000—in 1829, 977,000—in 1828, 858,000—in 1827, 712,000—in 1826, 937,000—in 1825, 700,000—and in 1824, 560,000. The crop of the present year is variously estimated at 1,200,000 to 1,250,000 bales—and the consumption has as yet kept pace with the increased cultivation. Since 1826, the consumption of the United States has doubled, and may now be estimated at 200,000, or more.

The increased facility of getting the crops of Virginia and of the northern part of North Carolina to market, by means of the rail road from Roanoke to Petersburg, has greatly added to the supplies at that place thus early in the season; and as an additional number of locomotive engines are about to be placed on the road, there will be additional inducements for planters to resort to that means of conveyance, which has of late been insufficient for the demands on it. The price of cotton has declined during this month from 16 c. to 14 c. or thereabout. Exchange on England is 7 per cent. or less.

X.

TO THE READERS OF THE FARMERS' REGISTER.

Having completed the first half year of our work, and sufficiently shown the benefits that *may be* derived from the plan, we beg leave to offer a few remarks upon the state and prospects of the Farmers' Register, considered as a means for obtaining such benefits.

The publication has been most favorably received by its patrons and by the public; and expressions of approbation and good will have been uttered far and near, among strangers as well as by friends, and in other States no less than in Virginia. Numerous testimonials of the high and general estimation of the Farmers' Register have been received from our correspondents, besides those which have been published when connected with other matter—and in the latter case, such expressions as were merely complimentary, have often been moderated, or altogether omitted in the publication. Our subscription list has already extended beyond our expectations, and continues to increase; and the undertaking has not only been secured from pecuniary loss, but promises an amount of profit, which at first was certainly not anticipated.

But with all the high degree of gratification which we have derived from this reception, we are not so deluded as to attribute it to editorial talents, nor so inflated as to be blind to the danger which still threatens to destroy the value, and even the existence of the Farmers' Register. We are certainly not disposed to depreciate its worth in the public estimation. On the contrary, we believe that if it was to end at this time, great and permanent benefits produced through its agency, would remain for the improvement of Agriculture. But these important services have been principally performed by our correspondents, and to them we yield the honor due. The light and instruction thus furnished by a few, establishes fully what we have before said might be done by the united efforts of all, or even of the greater part of our readers. But except from a few in comparison to the very many well qualified to afford valuable instruction, no such assistance has been offered, and we fear is not intended to be furnished. Nothing but that assistance is wanting to make the Farmers' Register every thing that the kindest and most sanguine of its friends may have anticipated: but without it, we do not hesitate to say (however opposed the admission may be to the maxims of our new trade,) that its usefulness will soon dimininish, and its existence perhaps will not last much longer. Neither complimentary expressions, nor subscribers, nor their money, will make an agricultural journal of much value, even if conducted by editorial talents very far surpassing our limited stock. But all that we ask, or wish, to insure the highest degree of success and usefulness for our work, will be that each reader, who is competent, will add something for the information of others, and in some degree act as others have done, and follow as well as applaud their good examples.

To all who have contributed to give character and usefulness to the Farmers' Register by their writings, we offer our warmest thanks, and request a continuation of the course which they have already commenced.

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